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ABSTRACT

The Vocational Education Amendments of 1976 mandate that sex bias and sex stereotyping be eliminated from all vocational education programs. In business and office occupations programs, the problems have been centered around increasing the number of male students in the program, encouraging women to move into management positions and other upper level supervisory jobs, and using sex-fair language in business communications. Responding to the Amendments, the state of Delaware developed a set of five sex equity modules designed (1) to focus on issues which are related to specific clusters of career options as defined in Delaware's competency-based, goal-oriented business and office occupations curriculum; (2) to provide information and materials for one to three days of activities; and (3) to focus the student's attention on those sex equity concerns which will affect her/his experiences as a student in the classroom, on-the-job, and in making career decisions. This module focuses on eliminating sex stereotyping in data processing and related occupations. Instructional activities in the module include a pre-opinion survey, case study, simulation exercise, terms describing men's and women's behavior, a slide-tape presentation, qualifications for employment, and a posttest. (KC)

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DATA PROCESSING AND RELATED OCCUPATIONS MODULE

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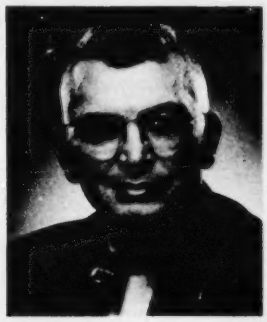

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PREFACE

The Vocational Education Amendments of 1976 mandate that sex bias and stereotyping be eliminated from all vocational education programs.

The amendments set aside $50,000 of each state's Federal vocational funds for this purpose and mandate that each state employ an individual full time to work on eliminating sex bias and stereotyping from vocational programs.

Each program area has special problems which must be addressed in order to achieve sex equity. In business and office occupations programs, the problems have been centered around increasing the number of male students in the program, encouraging women to move into management positions and other upper level supervisory jobs, and using sex-fair language in business communications.

The sex equity modules are designed to:

1. focus on issues which are related to specific clusters of career options as defined in Delaware's competency-based goal oriented business and office occupations curriculum;

2. provide information and materials for one to three days of activities; and

3. focus the student's attention on those sex equity concerns which will affect her/his experiences as a student in the classroom, on-the-job, and career decisions.

Instruction in business and office occupations programs should:

1. afford both male and female students opportunities to pursue a number of career options;

2. include a sex-fair curriculum; and

3. provide students with cooperative work experiences without regard to the sex of the student.

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I. INTRODUCTION TO THE CLUSTER

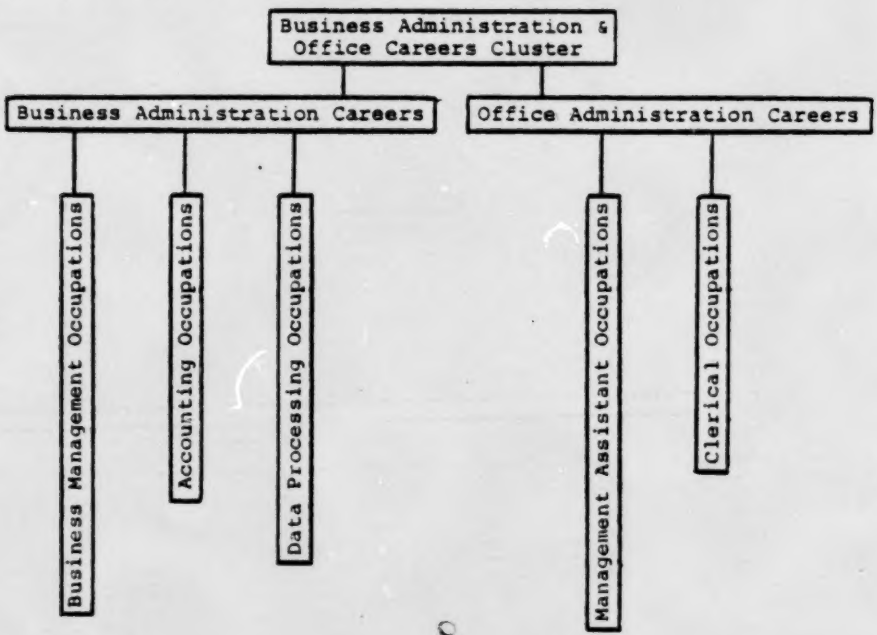
1. DESCRIPTION OF PROGRAMS

Business education represents a broad and diverse discipline that is included in a variety of educational delivery systems--elementary, secondary, and post-secondary schools. The dual purpose of this field of study is to educate individuals about business and to provide a continuous program of planned learning experiences designed to equip individuals with the technical skills necessary for competing successfully for employment in the business community.

Business education includes competency-based programs in office occupations, business teaching, business administration, and economic understandings. Specifically, the Business Administration and Office Careers Cluster provides career information and training that helps students relate their interests, needs, and abilities to occupational opportunities identified in five areas of concentration: business management, accounting, data processing, clerical, and management-assistant clusters. These five areas interrelate with each function providing opportunities for advancement beginning with entry-level jobs for the secondary-school graduate. However, many positions do require at least two years of technical post-secondary preparation.

2. VOCATIONAL BUSINESS MODEL

It is the function of this cluster to provide students with the competencies that will enable individuals to obtain appropriate jobs in their chosen business field--and to advance within an occupational grouping. In Delaware, the vocational business model consists of five sub-clusters which are illustrated below:



3. SUB-CLUSTERS

The specific jobs for which students are prepared in the sub-clusters are indicated on Figure 2 of this guide. Each specific job has been identified/verified via survey of the business community throughout the Delaware region.

4. DATA PROCESSING OCCUPATIONS (USOE 14.0200)

This sub-cluster is designed to give the student a working knowledge for a variety of jobs ranging from data typists to programmers. Because of the technical nature of this program, competency-based modules may originate in the public comprehensive business program or the vocational-technical programs at special training centers.

Data processing involves the collecting and processing of information through the medium of automated equipment. Raw information is collected and recorded. It is then processed, summarized, and sorted according to a pre-determined order. When all functions have been completed, the data can be interpreted by management and thus serve as a basis for decision-making. The results of the process may be stored for future use and reference.

Entrance into this area of work should include a knowledge of general office procedures, accounting, mathematics, the ability to keyboard, and the capability to think logically. The student should enjoy working with numbers and machines.

(a) Job Descriptions

Specific tasks to be learned by students concentrating in this sub-cluster relate to the following jobs:

(1) Terminal System Operator (D.O.T. 203.362-018)

Operates computer terminal and compiles data to produce business, scientific or technical reports, and publications in print-like format; reviews source documents, tables, correspondence, and company records to determine computer operations required to produce texts in requested format; clarifies instructions with document originator; arranges data input sequence; types coded commands on terminal keyboard to enter, store, retrieve, or delete data.

(2) Data Typist (D.O.T. 203.582-022)

Operates special-purpose electric typewriter to convert alphabetic, numeric, and symbolic data into coded form on punch cards or tape; loads

FIGURE 2

BUSINESS ADMINISTRATION AND OFFICE CAREERS CLUSTER

BUSINESS ADMINISTRATION CAREERS

BUSINESS MANAGEMENT OCCUPATIONS

[a] U.S.O.E.	[b] D.O.T.	POSITIONS
14.0803	189.167-034	Office Manager
14.0801	189.167-010	Admin. Ass't.
14.0899	189.167-022	Dept. Manager
- - - -	- - - - - - -	Small Business Operator

ACCOUNTING OCCUPATIONS

[a] U.S.O.E.	[b] D.O.T.	POSITIONS
14.0101	160.167-010	Accountant
14.0199	210.382-010	Audit Clerk
14.0102	210.382-026	Accts. Rec. Ass't.
14.0102	210.382-026	Accts. Pay. Ass't.
14.0103	211.362-010	Cashier
14.0105	211.362-018	Bank Teller
14.0199	214.482-010	Billing Ass't.
14.0199	215.367-022	Timekeeper
14.0199	215.482-010	Payroll Ass't.
14.0199	216.382-018	Balance Ass't.
14.0199	216-382-062	Statistical Ass't.
14.0102	216.482-010	Accounting Ass't. (bookkeeper)
14.0104	216.482-022	Calculating-Machine Operator

DATA PROCESSING OCCUPATIONS

[a] U.S.O.E.	[b] D.O.T.	POSITIONS
14.0201	203.362-018	Terminal Systems Operator
14.0202	203.582-022	Data Typist
14.0202	203.582-030	Keypunch Operator
14.0202	203.582-054	Terminal Operator
14.0299	209.387-022	Data Exam Ass't.
14.0299	213.132-010	Computer Operations Supervisor
14.0201	213.362-010	Computer Operator
14.0202	213.382-010	Computer/Peripheral Equipment Operator
14.0299	219.137-014	Data Control Ass't. Supervisor
14.0203	219.367-026	Programmer (Trainee)

a This number refers to U. S. Office of Education Codes for business and office occupations.

b Dictionary of Occupational Title- 1978 - This number refers to Department of Labor Codes for specific jobs within an occupational grouping.

punch cards, magnetic or paper tape reels into machines; types computer program from input data; proofreads and makes necessary corrections.

(3) Keypunch Operator (D.O.T. 203.582-030)

Operates alphabetic and numeric keypunch machines to transcribe data from source material onto punch cards and to record accounting or statistical data for subsequent processing by automatic or electronic data processing equipment.

(4) Terminal Operator (D.O.T. 203.582-054)

Operates on-line computer typewriter terminal to transmit data or to receive data from the computer at remote location.

(5) Data Examination Assistant (D.O.T. 209.387-022) (Input-Output Assistant)

Reviews input-output data to verify adequacy and appropriateness of material required for data processing operations; reviews work sheet listing materials required for specific data processing project and accompanying source documents.

(6) Computer Operations Supervisor (D.O.T. 213.132-010)

Supervises and coordinates workers' activities in operating electronic data processing machines; schedules work flow; oversees data; makes minor program and input data revisions to maintain operations.

(7) Computer Operator (D.O.T. 213.362-010)

Monitors and controls electronic computer to process business, scientific, engineering, or other data, according to operating instructions.

(8) Computer/Peripheral Equipment Operator (D.O.T. 213.382-

Operates on-or off-line peripheral machines according to written or oral instructions to transfer data from one form to another; mounts and positions materials; set guides, key and switches according, to instructions to prepare equipment for operation; observes materials for irregularities, printing defects or machine malfunctions.

(9) Data Control Assistant Supervisor (D.O.T. 219.367-014)

Supervises and coordinates activities of workers engaged in keeping control records and scheduling data to be processed on keypunch or electronic data processing machines; schedules flow of data.

(10) Programmer (Trainee) (D.O.T. 219.367-367)

Selects symbols from coding system and codes successive steps of completed program for conversion to machine instructions, to process data, or to control industrial processes; reads and interprets sequence of alphabetic, and numeric data for each program step to translate into machine language that can be converted by the computer processor into machine instructions.

(b) Employment Outlook

Electronic data processing is one of the most exciting occupational fields the world has to offer young men and women today. It is rapidly growing and is one of the most challenging and rewarding fields.

II. DATA PROCESSING AND RELATED OCCUPATIONS - PERFORMANCE AND OBJECTIVES

1. FOCUSES

(a) Employer/Employee relationships.

(b) Attitudes about the behavior patterns of men and women.

(c) Simulated activities on the task of systems analyst, programmer and computer operator.

2. ACTIVITIES

(a) Pre-Test.

(b) Case study on handling conflict with subordinates.

(c) Simulation exercise on all career options in Data Processing.

(d) Conflicting terms describing men's and women's behaviors.

(e) Slide-Tape presentation.

(f) Qualifications for employment.

(g) Post-Test.

3. PERFORMANCE OBJECTIVES

(a) Given an opportunity to discuss "boss-employee" relations, the student will with 100 percent accuracy list two special problems that may develop if the "boss" is a woman.

(b) Given an activity concerning the stereotyped behavioral patterns of men and women, the student will with 100 percent accuracy list two examples of these stereotypes, one adversely effecting men and one adversely effecting women.

(c) Given examples of tasks performed in the data processing field, the student will with 100 percent accuracy list two examples of why any of the jobs could be done by either a man or a woman.

III. INTRODUCTION TO DATA PROCESSING MODULE

In our age of specialization, it is not surprising to discover that a higher degree of technology is needed in the business world.

There are 70,000 to 80,000 computers in the United States today, and there are over one million people who work with computers in one way or another. Women in data processing usually are employed as keypunch operators and men have traditionally dominated the areas of programming, sales, manufacturing, and repair.

Women need to take the mandatory courses that lead to top-paying positions in data processing, but have been reluctant to do so until recently.

Although there is still room for improvement, the areas of data processing have been less stereotyped than other areas because it is a new field and does not carry with it the historical stereotypes of male and female jobs.

Hopefully this area will continue to provide readily available opportunities for women and men at all levels of employment.

This module focuses on the "on the job" issues in data processing and includes:

(a) Employer/employee relationships.

(b) Attitudes about the behavior patterns of men and women.

(c) Simulated activities on the tasks of the systems analyst, programmer, and computer operator.

1. OVERVIEW OF INSTRUCTIONAL ACTIVITIES

(a) Pre-test

The pre-opinion survey should be administered to measure the students attitudes toward sex role stereotyping in our society. The survey will provide the teacher with an indication of the students attitudes on sex equity.

(b) Case Study

Give each student a copy of "Handling Conflict from Subordinators." Have the students read the case study, answer the questions, and be prepared to discuss the situation with the class.

(c) Simulation Exercise

The instructions for this activity are found on the activity sheet.

(d) Terms Describing Men's and Women's Behavior

Display the overhead and discuss the terminology used in the "balloons" and how it applies to on-the-job situations. How do attitudes about the way men and women react in different situations effect job assignments?

(e) Slide-Tape Presentation

(f) Qualifications for Employment

Qualifications for employment are designed to:

- To expose students to the many different jobs available in an occupation and to show students that the qualifications for employment are not determined by sex.

(g) Post-test

Have the students take the pre-test again and assess themselves relative to changes in attitudes.

ACTIVITY (a)

Pre/Post Test

Yes	No	
		1. The way things are now, it's better to be a man than a woman.
		2. Women shouldn't want to change things because they have the best deal now.
		3. It's OK for a girl to play on a male team if she's a good athlete.
		4. Men should make the important decisions because men think, while women act on their emotions.
		5. It's OK for a woman to be assertive.
		6. It's OK for a woman to be aggressive.
		7. It's OK for a boy to cry.
		8. It's OK for a man to cry.
		9. It's important to me that a man act like a "real man" and that a woman act like a "real woman."
		10. A woman should not compete with a man because this damages his ego.
		11. I often act in a way that a person of my sex "isn't supposed to."
		12. I get mad when people tell me that how I act isn't "right" for my sex.
		13. Men should be more honest about their feelings toward other people.
		14. Men should be more open with other people about their own inadequacies.
		15. Women are less self-confident than men.
		16. Men should pretend to know more than they really do, in order to appear "professional."
		17. Men should pretend to be able to do more than they really can, in order to appear successful.

Yes No

18. It is hard for women to do their best when competing with men.

19. Men like women who are followers not leaders.

20. Women like to rely on others when there are decisions to make.

21. Women need more encouragement and approval than men to work effectively.

22. Women are more easily taken advantage of than men.

23. Women lose their sex appeal as they get older, whereas men don't.

24. Women lose their good looks as they get older, whereas men don't.

25. Boys and girls should be brought up in the same way.

ACTIVITY (b)

Handling Conflict From Subordinates

Arlene Thomas has worked for ABS Products for eight years as a keypunch operator. During her tenure, she has held an excellent work record; almost perfect attendance, commendations from several of her superiors, and an ability to work well with the others in her department.

Approximately eight months ago, the supervisor of data entry for the company retired and Arlene was promoted to his position. Throughout this period of time, productivity has decreased, accuracy has diminished, the keypunch operators spend more time on breaks than working, and there is much in-fighting in the department.

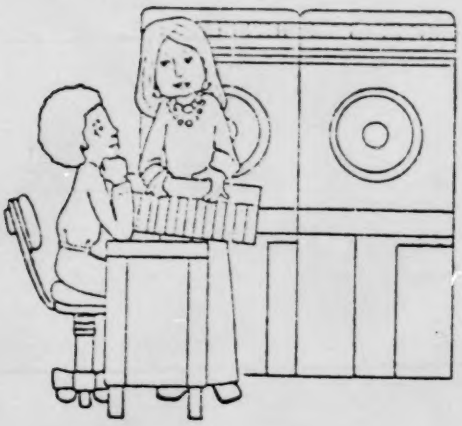
Recently, several department supervisors have complained to Arlene that reports are behind due to slow keypunching and are not correct. One even noticed that several of Arlene's girls consistently dressed below company standards.

Student Discussion Questions:

1. What might be some reasons for the problems mentioned above?

2. What are Arlene's alternatives with her employees?

3. What can Arlene do to alleviate the situation with the other department supervisors?



ACTIVITY (c)

Spending A Day In The

DATA PROCESSING DEPARTMENT

of MARY LEE CANDY DISTRIBUTORS

1. PURPOSE AND MAJOR ACTIVITY

Students participate in activities of the systems analyst, programmer, and the computer operator in a candy distributor's business.

Because the glamorous part of computers and data processing is so prevalent in newspapers, magazines, and other literature, it is not included in detail in this unit. The first optional activity described on the next page contains suggestions for a classroom library of such material. As a teacher, you are provided here with simulation activities that will help students get the "feel" of some of the down-to-earth work of data processing personnel.

(a) Before Class Begins:

(1) Duplicate enough copies of the simulation packet (white sheets at end of this unit) to provide each student with a copy.

(2) Read "Background Information on Data Processors" on page 31.

(3) Read the second optional activity starting on page 12, entitled Tell the Computer How to Compute; and decide whether you will conduct it. The basic advantage of using this activity is that students will learn how limited the computer is in its operation, even though we have read and heard much to the contrary. It will give them a feel of what it is like to program a computer.

(b) During Class:

(1) Distribute the simulation packets, reading and discussing the first page with students. Suggested discussion topics are given in the teacher's key to the simulation (pages 16-30).

(2) Ask students to complete pages 2 through 14 of the simulation. You may want to conduct this unit as a group project rather than an individualized activity.

(3) When students have finished, go through the simulation with them, checking answers and discussing the topics shown in the teacher's key.

(4) After checking the simulation exercises, have students turn to page 46 to answer and discuss the questions listed there.

2. OPTIONAL ACTIVITIES

(a) Set up a Library

Some ideas for a classroom library are listed below. Allow interested students to check out books and pamphlets.

(1) Books and Pamphlets

"Opportunities in Electronic Data Processing"
by Martin Nussbaum, 1972
Vocational Guidance Manuals
235 E. 45 Street
New York, New York 10017
$4.95

"Your Future in the Electronic Computer Field"
by Dause L. Bibby, 1970
Book Service
501 Lake Forest Avenue
Highwood, Illinois 60040
$2.45

American Federation of Information Processing Societies, Inc.
210 Summit Avenue
Montvale, New Jersey 07645
Send for single free copy of "Facts on Computer Careers," 1973
Superintendent of Documents
Washington, DC 20402
Send 60¢ for "Occupations in Electronic Computing Systems," (No. 17 S 2913-0067) 1972.

(2) Associations to which you can write for information

American Society for Information Science
2000 P Street N.W.
Washington, DC 20036

Association for Educational Data Systems
1201 Sixteenth Street N.W.
Washington, DC 20036

Business Equipment Manufacturers Association
235 E. 42nd Street
New York, New York 10017

Systems and Procedures Association
7890 Brookside Drive
Cleveland, Ohio 44138

IEEE, Computer Group
345 E. 47th Street
New York, New York 10017

Society for Information Display
654 N. Sepulveda Blvd.
Los Angeles, CA 90049

Special Libraries Association
235 Park Avenue S
New York, New York 10003

(b) Tell the Computer How to Compute

An interesting and profitable activity would be to simulate a computer. The steps for carrying out the simulation as a play are described on pages 13-15. You may want to duplicate these pages and let students preview them at school or at home.

(1) Assign roles to be played

(i) Computer--someone who will act like a computer, whose input will be through the ears by voice and whose output it writes on the blackboard. Also, the person taking the role of computer will have a large red card or flag to raise when the computer won't accept the instruction.

(ii) Systems Analyst--someone who plans when the computer will add, subtract, multiply, divide, etc.

(iii) Programmer--someone who will instruct the computer what to do, bearing in mind its limitations.

Instructions that the Computer can Accept

When instructed, it can do the following:

1. Write numbers on the blackboard one under another, or side by side, such as:

   345 345 128
   128

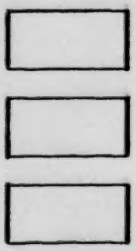
2. Subtract a smaller digit from a larger one, such as, "Subtract 5 from 8."

3. Regroup or borrow after it has signalled that it can't subtract a larger digit from a smaller one, such as "Subtract 8 from 5."

4. Rearrange and regroup a subtraction problem.

Problem	Problem Rearranged
345	300 + 30 + 15
-128	100 + 20 + 8

5. Write answers in boxes lined up under one another such as:



6. Erase numbers that have been used.

7. Answer "yes" to such questions as, "Are you ready?" or, "Can you subtract 5 from 8?" by raising a white card with a "yes" on it in large letters.

8. Answer "no" to such questions as, "Can you subtract 8 from 5?" by raising a white card with "no" on it.

9. Flash red by raising a red card when asked to do something it is not supposed to do.

Scenario

The computer stands at the blackboard and has the following:

chalk	white card, lettered "yes"
eraser	white card, lettered "no"
	red card

The systems analyst and programmer sit in chairs on either side of the computer. The co-stars of the cast are the computer and the programmer. The computer will be rated very high if it performs only what it is supposed to and raises the red card when the programmer does not give sufficient instructions. The programmer will be rated high if he/she instructs the computer in sufficient detail so that it has to perform and doesn't raise the flag. The systems analyst has a minor role in this play.

Scene 1

Systems analyst: I have examined our business and find that to keep inventory records we must subtract the amounts on shipping orders from inventory. I am requesting the programmer to cause the computer to subtract 128 from 345.

Scene 2

Programmer to computer: Are you ready?

Computer: Holds up card with yes.

Programmer: Write 345 and under it the subtrahend 128.

Computer: Writes.

$$\begin{array}{r} 345 \\ \underline{128} \end{array}$$

Programmer: Can you subtract 8 from 5?

Computer: Holds up card with no.

Programmer: Regroup the number 345 by writing opposite it the numbers 300 + 30 + 15.

Computer: Writes opposite $\begin{array}{r} 345 \\ \underline{128} \end{array}$ 300 + 30 + 15

Programmer: Opposite 128, write 100 + 20 + 8.

Computer: Writes and now has on the board:

$$\begin{array}{r} 345 \\ \underline{128} \end{array} \qquad \begin{array}{r} 300 + 30 + 15 \\ \underline{100 + 20 + \ 8} \end{array}$$

Programmer: Subtract 8 from 15 and write the difference in the box.

Computer: Writes the difference in the box. [7]

Programmer: Erase the numbers used.

Computer: Erases 15 and leaves on the blackboard:

$$\begin{array}{r} 8 \\ \\ 345 \\ \underline{128} \end{array} \qquad \begin{array}{r} \\ \\ 300 + 30 \\ \underline{100 + 20} \end{array}$$

[7]

Programmer: Subtract 20 from 30 and write the difference in the box.

Computer: Writes the difference in the box. [10]

Programmer: Erase the numbers used.

Computer: Erases 30 and leaves on the blackboard:

$$\begin{array}{r} 20 \\ \\ 345 \\ \underline{128} \end{array} \qquad \begin{array}{r} \\ \\ 300 \\ \underline{100} \end{array}$$

[7]

[10]

Programmer: Subtract 100 from 300 and write the difference in the box.

Computer: Writes the difference in the box. [200]

Programmer: Erase the numbers used.

Computer: Erases 300 and leaves on the blackboard:

$$\begin{array}{r} 100 \\ \\ 345 \\ \underline{128} \end{array}$$

[7]

[10]

[200]

Programmer: Add differences and write the answer in the box.

Computer: Writes the answer in the box. [217]

The three members of the cast take bows. The teacher may invite the class to vote which of the two, the programmer and the computer, best played their roles according to the rules.

KEY

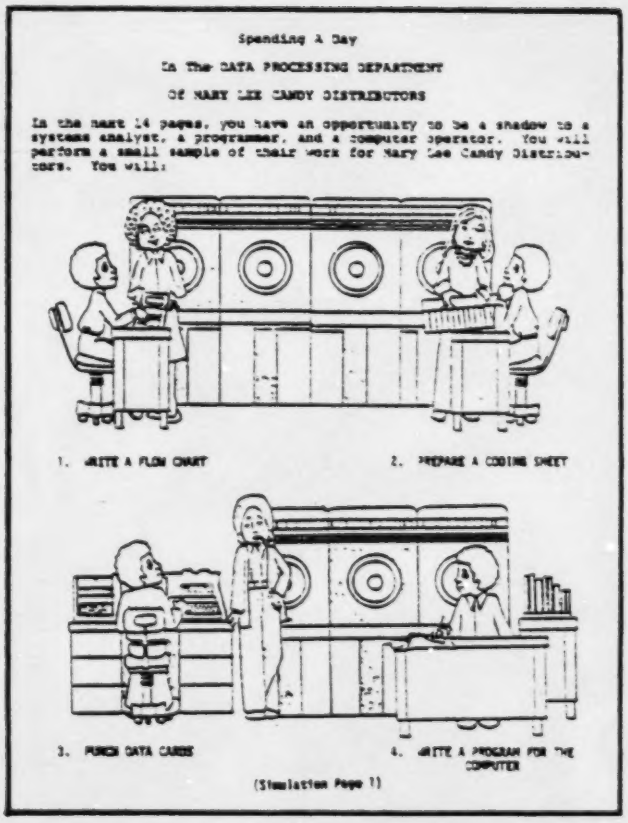
Simulation Page 1

As you discuss the packet introductory page with students, supplement the discussion with information from page 31, "Background Information for Data Processors."

If some of your students are acquainted with people who work in data processing occupations, ask them to describe some of the tasks performed by these people and to tell in what types of organization they work.

Before having students begin the simulation exercise, discuss the meanings of special terms on page 1 of the simulation packet:

- systems analyst
- programmer
- computer operator
- flow chart
- coding sheet
- punched cards
- program



Spending A Day

In The DATA PROCESSING DEPARTMENT

Of MARY LEE CANDY DISTRIBUTORS

In the next 14 pages, you have an opportunity to be a shadow to a systems analyst, a programmer, and a computer operator. You will perform a small sample of their work for Mary Lee Candy Distributors. You will:

1. WRITE A FLOW CHART
2. PREPARE A CODING SHEET
3. PUNCH DATA CARDS
4. WRITE A PROGRAM FOR THE COMPUTER

(Simulation Page 1)

Key

Simulation Page 2:

Read this page with the students so that they understand the entire situation. Be sure they understand that Mary Lee Candy Distributors buys from a manufacturer and sells to 27 retailers.

Go over the notes taken by the systems analyst and make certain the students recognize the need for a "perpetual" inventory record versus a "guessed" one. Ask the students whether it would likely be feasible to take an actual count, every time someone wants to know, "How much candy do we have on hand?"

Be sure they can define "perpetual inventory." It is one which can constantly answer the question, "How much candy do we have in stock?"

Activity 1

Preparing a Flow Chart on Inventory Processes

You are going to spend a day as an assistant in the data processing department of Mary Lee Candy Distributors which wholesales Mary Lee boxes of chocolates to 27 retail stores. The retail stores in turn sell to shoppers who pass by the stores. Mary Lee Candy Distributors obtain the candy from a manufacturer. You will spend some time working with the systems analyst, the programmer, and the computer operator. In each case, you will be required to perform some of the work that these employees are doing at the time you are with them.

When you arrive at the Mary Lee Candy Distributors, you are first introduced to the systems analyst who is preparing a flow chart about one operation of the Mary Lee Candy Distributors. This operation concerns keeping an inventory of boxes of chocolates. The systems analyst hands you some notes to read that he has made after the president of the company directed him to set up a perpetual inventory of candy stock. Perpetual inventory is defined as a record of boxes of candy on hand at all times. Previously, the inventory was taken on the first of the month. Thus, the actual number of boxes on hand was known only on the first of the month.

Perpetual Inventory Notes

February 17, 19--

1. The president has directed the systems analyst to set up a system to keep a perpetual inventory.
2. In order to start the system, it will be necessary to obtain an actual count of all boxes of candy on hand.
3. Then, copies of all receiving tickets of candy from the manufacturers must be sent to the data-processing department daily.
4. The receipts as shown on the receiving tickets must be immediately added to the inventory.
5. Copies of all shipping orders of candy going to the Mary Lee Retail Stores must be sent to the data-processing department.
6. The issue of candy as shown on shipping orders must be immediately subtracted from the inventory.
7. At any time during the business day, the data-processing department should be able to report by telephone the current inventory to other departments.
8. A report (printout) of the current inventory should be made available to the president at 8:00 a.m. each day.

(Simulation Page 2)

Key

Simulation Page 3:

This activity provides an introduction to one kind of block diagram flow chart.

Have students write a short statement beginning with a verb taken from the notes on the previous page.

Ask the students where in the business they think each event takes place. Sample answers are given below:

Block 1 - Systems analyst's office in the DP department

Block 2 - Stock department

Block 3 - Receiving department or dock.

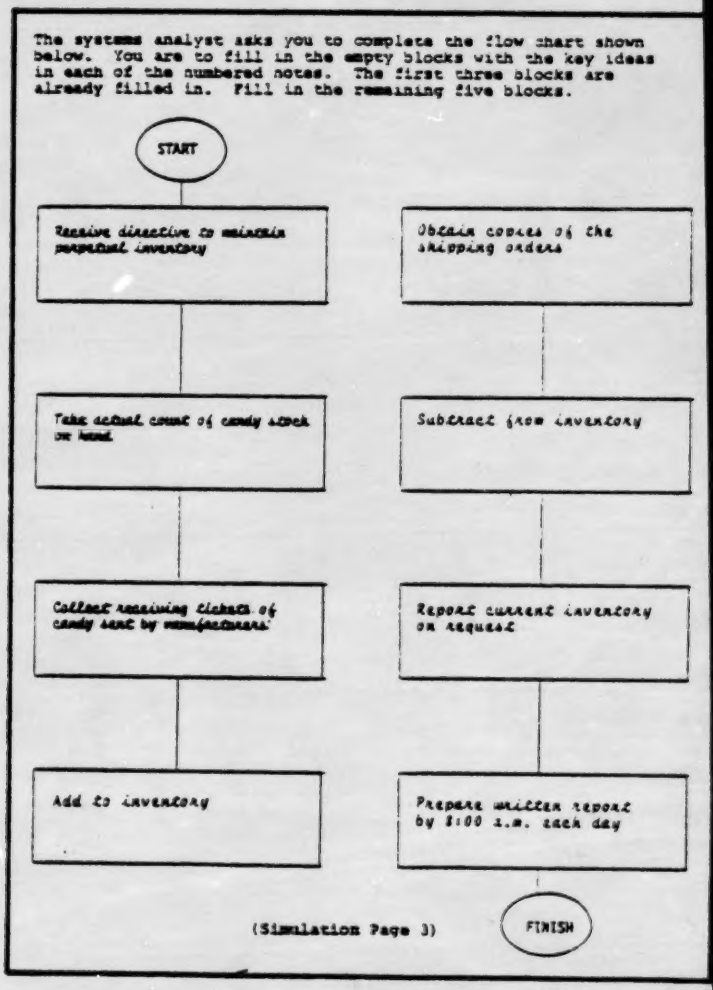
Block 4 - DP department

Block 5 - Sales Office

Block 6 - DP department

Block 7 - DP department

Block 8 - DP department


The systems analyst asks you to complete the flow chart shown below. You are to fill in the empty blocks with the key ideas in each of the numbered notes. The first three blocks are already filled in. Fill in the remaining five blocks.
START
Receive directive to maintain perpetual inventory
Obtain copies of the shipping orders
Take actual count of candy stock on hand
Subtract from inventory
Collect receiving tickets of candy sent by manufacturers
Report current inventory on request
Add to inventory
Prepare written report by 8:00 a.m. each day
(Simulation Page 3)
FINISH

Key

Simulation Page 4:

Explain the use of the coding form. The coding form is one way to prepare data for entry into the computer. In this case, information on the Receiving Report and the Shipping Order is to be entered on the coding form.

Be sure the students can correctly answer all the questions about the Receiving Report.

Ask them which is most important for inventory, "Quantity Ordered" or "Quantity Received". Answer: Quantity Received. In this case, these quantities happen to be the same.

Activity 2

Preparing a Coding Form

Next, you are introduced to Sharon Burns, the computer operator, who is preparing a coding form. The preparation of a coding form is only one of her many duties. A coding form is used to prepare information for the computer. She shows you two business forms and a coding form on which some information from the forms has been written. Sharon shows you how to find information on the forms and copy it on the coding form. Later, you will have the opportunity of finding out how the coding form is used to put information into the computer.

Mary Lee Candy Distributors
4120 Peach Street
Atlanta, Georgia

RECEIVING REPORT
No. 2873
Date 1/7/--

Purchased From:

Sweet Chocolate Confectionery Mfg. Co.
4568 Industrial Parkway
New Orleans, Louisiana

Quantity Ordered	Quantity Received	Stock Number	Description	Unit Price
1,000 boxes	1,000 boxes	305	Chocolates	

Goods Received 1/10/--
Quantity Checked [illegible]

Receiving Report: Look at the Receiving Report above and answer the following questions:

1. Did Mary Lee Candy Distributors receive something from the Sweet Chocolate Confectionery Manufacturing Company? YES
2. What was received? 1,000 Boxes of candy
3. What is the stock number of the "thing" received? 305
4. How much was received? 1,000 Boxes of candy
5. When was it received? 1/10/--
6. Was the quantity checked to see whether the correct amount was received? YES, initialed by M.S.V.

(Simulation Page 4)

Key

Simulation Page 5:

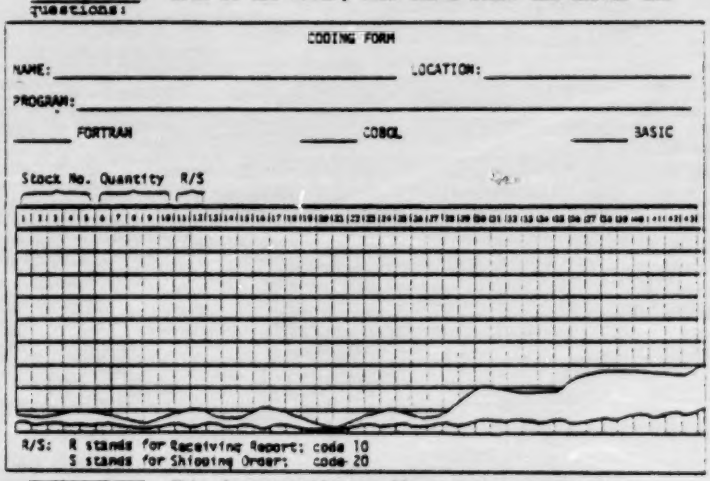
If possible, obtain a full-size coding form from the school business office or from a nearby industry to show the students.

Tell the students that the coding sheet is often used to punch cards on a key-punch machine.

Review the coding form with the students and make certain they can correctly answer the questions about it.

If the students ask about Fortran, COBOL, and Basic, tell them they are names for computer languages. Tell them that the computer cannot understand our English, so we must tell it what to do in another language, "Computer Talk." If students are further interested, invite a programmer to explain some more to them.

Coding Form: Look at the coding form shown below and answer the questions:



Coding Form: This form usually has 80 columns instead of the 41 shown. It usually has 25 rows. The terms Fortran, COBOL, and Basic refer to computer languages which are studied in computer training programs.

Answer the following questions:

1. How many columns does a complete coding form usually have? 80 (Hint: See the note beneath the Coding Form.)
2. How many rows does a complete coding form usually have? 25
3. How many spaces are available for the Stock Number? 5 (Hint: See middle left of the Coding Form.)
4. How many spaces are available for the quantity? 5
5. What does the R in R/S mean and what is its code? Receiving Report 10
6. What does the S in R/S mean and what is its code? Shipping Order 20
7. How many spaces are available for an R or an S? 1

(Simulation Page 5)

Key

Simulation Page 6:

Show the students how to enter the stock number on the coding form. Have them observe that five columns are allowed. Since only three are used, the remaining two are filled in with zeroes.

In a similar manner, show them how to enter the quantity on the coding form and to fill in one column with a zero.

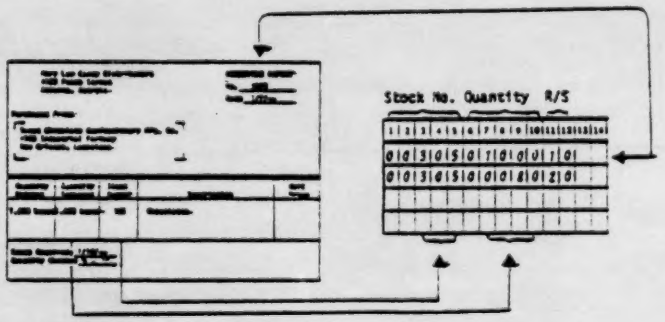
The kind of report (Receiving Report) is also coded since the computer must be told whether something is being "received" or "shipped."

Have the students notice that a receiving report is assigned a 10 and is so coded in columns 11 and 12.

Check their answers to the questions at the bottom of the sheet for accuracy.

Entering the Receiving Report on the Coding Form

The Receiving Report is coded on the first line of the coding form as shown below. Note that zeroes are used to fill in the blank spaces. Also notice how the stock number 305 is written in columns 1-5 and that two zeroes are written in front of 305 to fill up all five columns.



Answer the following questions:

1. How much candy was received? (See the Receiving Report.)
   1,000 boxes
2. In which columns of the Coding Form was the quantity written?
   7-10
   How many zeroes were needed to fill up the spaces in front of the quantity?
3. In which columns of the Coding Form was the stock number written? 1-5
   How many zeroes were needed to fill up the spaces in front of the stock number? 2
4. What number is used to show the kind of report that is being put on the coding form? 10
5. In which columns is the Receiving Report code number written?
   11-12

(Simulation Page 6)

Key

Simulation Page 7:

Be sure the students can correctly answer all the questions about the shipping order.

If students ask about missing unit prices, tell them that the shipping order is a carbon copy of another form (Invoice) and that the price is frequently omitted on the shipping order copy.

The same is true about the omission of the unit price on the receiving report, which is a carbon copy of a purchase order.

Shipping Order

Mary Lee Candy Distributors
4120 Peach Street
Atlanta, Georgia

SHIPPING ORDER
No. 4749
Date 1/5/--

Sold To: Mary Lee # 10
South Shopping Mall
Atlanta, Georgia

Ship To: Same

Quantity Ordered	Stock Number	Description	Unit Price	Quantity Shipped	Quantity Back Ordered
80 boxes	305	Mary Lee chocolates		80 boxes	

Look at the Shipping Order above and answer the following questions:

1. What is the name of the store that Mary Lee Candy Distributors sent some candy to? Mary Lee #10
2. How many boxes were sent? 80 boxes
3. What is the stock number of the candy sent? 305

(Simulation Page 7)

Key

Simulation Page 8:

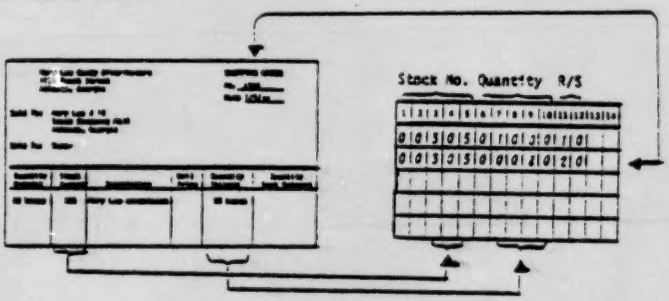
Again, show the students how to enter the stock number and the quantity on the coding form; in this case, from the shipping order.

Have the students notice that the shipping order is assigned a 20 and is so coded in columns 11 and 12.

Check the answers of the students at the bottom of the sheet for accuracy.

Entering the Shipping Order on the Coding Form

The Shipping Order is coded on the second line of the Coding Form as shown below:



Answer the following questions:

1. In which columns of the Coding Form was the quantity shipped written? 9-10
2. How many zeroes were needed to fill up the empty spaces? 3
3. In which columns of the Coding Form was the stock number written? 1-5
4. How many zeroes were needed to fill up the empty spaces? 1
5. What number is used to show the kind of report that is being put on the Coding Form? 20
6. In which columns is the Shipping Order code number written? 11 and 12

Your Job Assignment

Copy the necessary information from these two forms on the Coding Form on page 41. Sharon has put you on your own.

(Simulation Page 8)

Key

Simulation Page 9:

These business papers are coded on the next page.

Mary Lee Candy Distributors
4120 Peach Street
Atlanta, Georgia

RECEIVING REPORT
No. 2674
Date 1/15/--

Purchased From:
Sweet Chocolate Confectionery Mfg. Co.
4568 Industrial Parkway
New Orleans, Louisiana

Quantity Ordered	Quantity Received	Stock Number	Description	Unit Price
500 boxes	500 boxes	306	Chocolates	

Goods Received 1/10/--
Quantity Checked 3 / 7

Mary Lee Candy Distributors
4120 Peach Street
Atlanta, Georgia

SHIPPING ORDER
No. A750
Date 1/8/--

Sold To: Mary Lee # 19
South Shopping Mall
Atlanta, Georgia

Ship To: Same

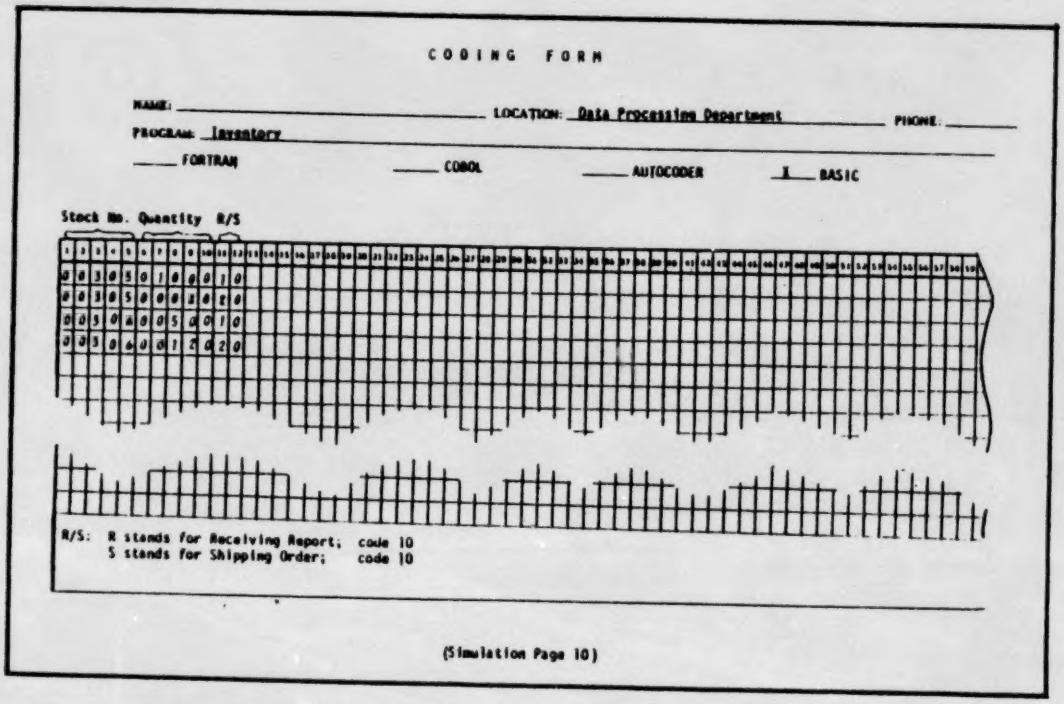
Quantity Ordered	Stock Number	Description	Unit Price	Quantity Shipped	Quantity Back Ordered
120 boxes	306	Mary Lee chocolates		120 boxes	

(Simulation Page 9)

Key

Simulation Page 10:

The two business papers on page 9 are coded on lines 3 and 4. This coding sheet will be used to "punch cards" in Activity 3.



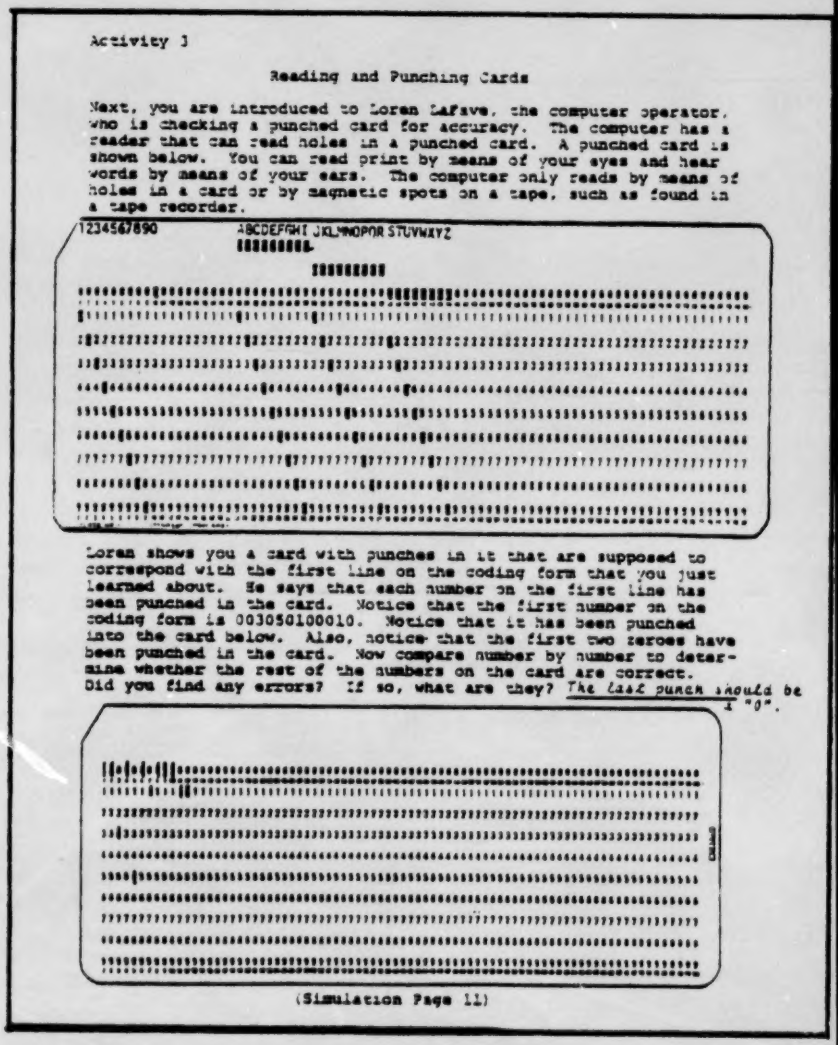
Key

Simulation Page 11:

Explain to the students how numbers are punched in a card. You can also explain how the alphabet is punched if the students are interested, but they will not be required to punch alphabetic characters.

Have the students check the accuracy of the number punched in the bottom card. The number punched is 003050100011, and it should be 003050100010, the last punch being an error.

If you can obtain additional cards, you might have students "punch" their names in the cards by using their pencil to blacken the proper places. In addition, they could exchange cards and proofread each other's cards.



Activity 3

Reading and Punching Cards

Next, you are introduced to Loren Lafave, the computer operator, who is checking a punched card for accuracy. The computer has a reader that can read holes in a punched card. A punched card is shown below. You can read print by means of your eyes and hear words by means of your ears. The computer only reads by means of holes in a card or by magnetic spots on a tape, such as found in a tape recorder.

1234567890 ABCDEFGHI JKLMNOPQR STUVWXYZ

Loren shows you a card with punches in it that are supposed to correspond with the first line on the coding form that you just learned about. He says that each number on the first line has been punched in the card. Notice that the first number on the coding form is 003050100010. Notice that it has been punched into the card below. Also, notice that the first two zeroes have been punched in the card. Now compare number by number to determine whether the rest of the numbers on the card are correct. Did you find any errors? If so, what are they? The last punch should be a "0".

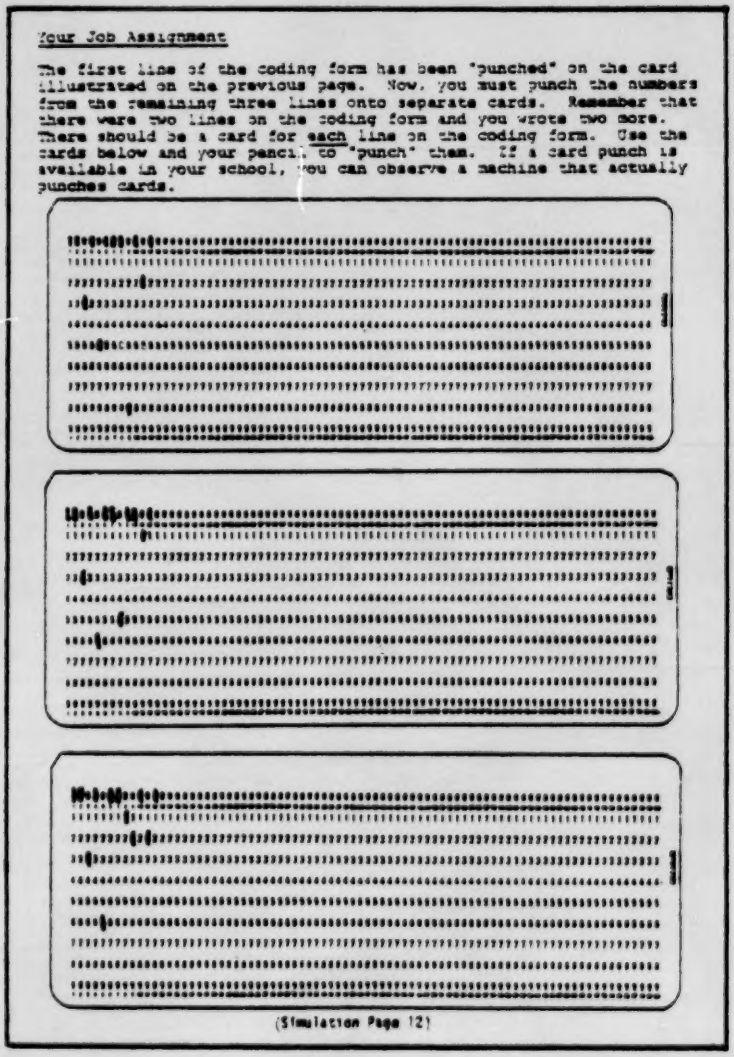
(Simulation Page 11)

Key

Simulation Page 12:

Go over the cards with the students to check the accuracy of their work.

You might have them exchange and proofread each other's cards.


Your Job Assignment
The first line of the coding form has been "punched" on the card illustrated on the previous page. Now, you must punch the numbers from the remaining three lines onto separate cards. Remember that there were two lines on the coding form and you wrote two more. There should be a card for each line on the coding form. Use the cards below and your pencil to "punch" them. If a card punch is available in your school, you can observe a machine that actually punches cards.
(Simulation Page 12)

Key

Simulation Page 13:

Before assigning Activity 4, have the students act out the "play", Tell the Computer How to Compute as explained at the beginning of this unit.

Go over this in detail with the students.

Tell the students that arithmetic problems can be done by the computer only when each instruction is carefully planned. Later, these instructions are written again in computer language. Once they are placed in the computer memory, they can be used to solve thousands and thousands of subtraction problems.

Activity 4

Preparing A Program for the Computer

Next, you are introduced to Juan Garcia, a computer programmer, who shows you some instructions he is writing for the computer. He tells you that later these instructions have to be re-written in computer language, which he will show you when he is ready to do that step. He tells you that when you want to solve a problem such as adding and subtracting numerous items from the inventory, you can't just hand the computer the problem. You must prepare detailed instructions, which are put into the computer memory so that it can compute inventory. Suppose that you wanted the computer to do this problem: Subtract 173 from 432.

Below is shown what Juan has been writing.

Instructions	Mathematics	Answer Space
1. Read A and B.	1.	
2. A is 432.	2. 432	
3. B is 173.	3. 173	
4. Start at the right. Can 3 be subtracted from 2? If so, subtract. If not, go to the next step.	4. No	
5. Regroup 432 as 420 and 12.	5. 420 + 12	
6. Under 420 + 12, rearrange 173 as 170 and 3.	6. 170 + 3	
7. Subtract 3 from 12. Write 9 in the answer space.	7. 12 - 3	9
8. Can 70 be subtracted from 20? If so, do it. If not, go to the next step.	8. No	
9. Regroup 420 as 300 and 120.	9. 320 +120	
10. Beneath 300 + 120, rearrange 170 as 100 and 70.	10. 100 + 70	
11. Subtract 70 from 120. Put 50 in the answer space.	11. 120 - 70	50
12. Can 100 be subtracted from 300? If so, do it.	12. 300 -100 200	
13. Put 200 in the answer space.		200
14. Add all the numbers in the answer spaces.	14.	259

(Simulation Page 13)

Key

Simulation Page 14:

Since the type of thinking required to write program instructions may be new to the students, choose one of the following two procedures.

A. Write the program similar to that done by Juan as a group activity under your direction.

B. Have students complete it in small groups. Be sure that each group has one person who is known to be logical and methodical.

As a result of these assignments, students can determine whether they have some of the qualities required to be a programmer.

Juan says that programmers have to be able to write instructions for computers before they rewrite them in computer language. He tells you to write instructions for this problem: Subtract 48 from 235. Use the space below. You may or may not need 14 steps. Use as many as needed.

Instructions	Mathematics	Answer Space
1. Read A and S.		
2. A is 235.	235	
3. S is 48.	48	
4. Can S be subtracted from 5? If so, subtract. If not, go to the next item.	No	
5. Regroup 235 as 220 and 15.	220 + 15	
6. Under 200 and 15, rearrange 48 as 40 and 8.	40 + 8	
7. Subtract 8 from 15. Write 7 in the answer space.		7
8. Can 40 be subtracted from 220? If so, subtract and write 180 in answer space.	220 -40	180
9. Add all numbers in the answer spaces.		187
10.		
11.		
12.		
13.		
14.		

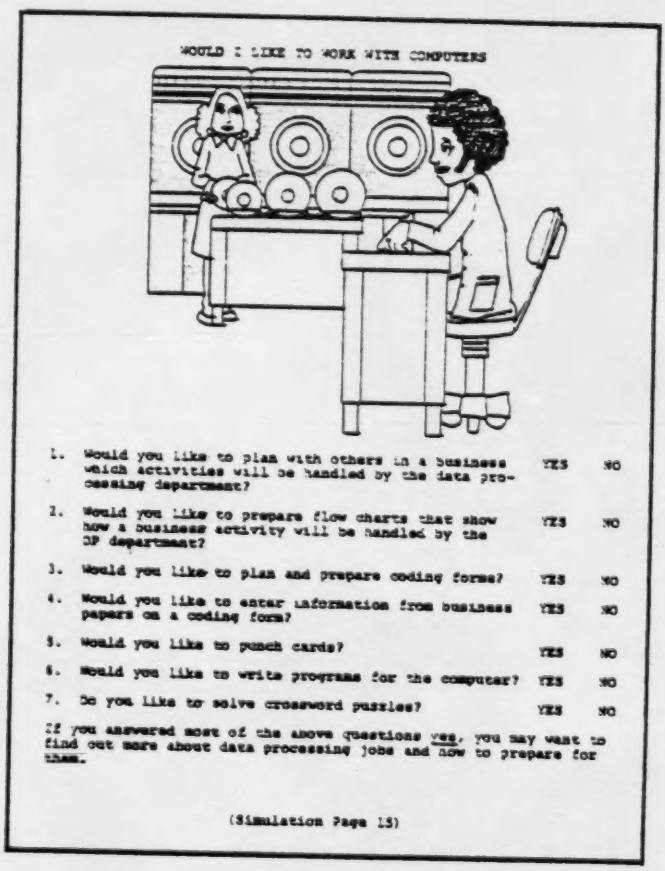
(Simulation Page 14)

Key

Simulation Page 15:

The purpose of the questions on page 15 of the simulation is to encourage students to examine their own abilities and personalities and compare these to the characteristics needed to succeed in the occupation explored in this simulation.

Encourage students to talk about their own likes and dislikes and about the things they think they would like and dislike about this occupation.



WOULD I LIKE TO WORK WITH COMPUTERS

1.	Would you like to plan with others in a business which activities will be handled by the data processing department?	YES	NO
2.	Would you like to prepare flow charts that show how a business activity will be handled by the DP department?	YES	NO
3.	Would you like to plan and prepare coding forms?	YES	NO
4.	Would you like to enter information from business papers on a coding form?	YES	NO
5.	Would you like to punch cards?	YES	NO
6.	Would you like to write programs for the computer?	YES	NO
7.	Do you like to solve crossword puzzles?	YES	NO

If you answered most of the above questions yes, you may want to find out more about data processing jobs and how to prepare for them.

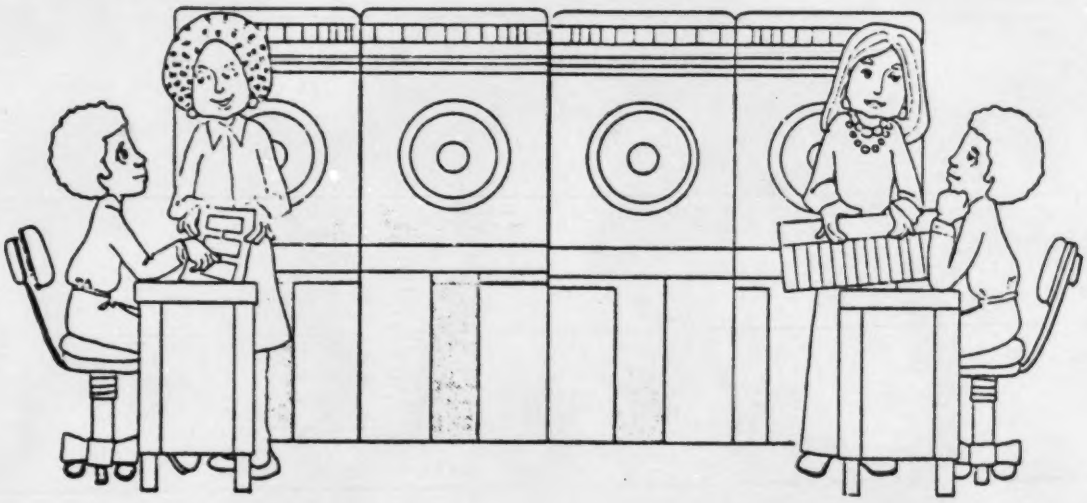
(Simulation Page 15)

Spending A Day

In The DATA PROCESSING DEPARTMENT

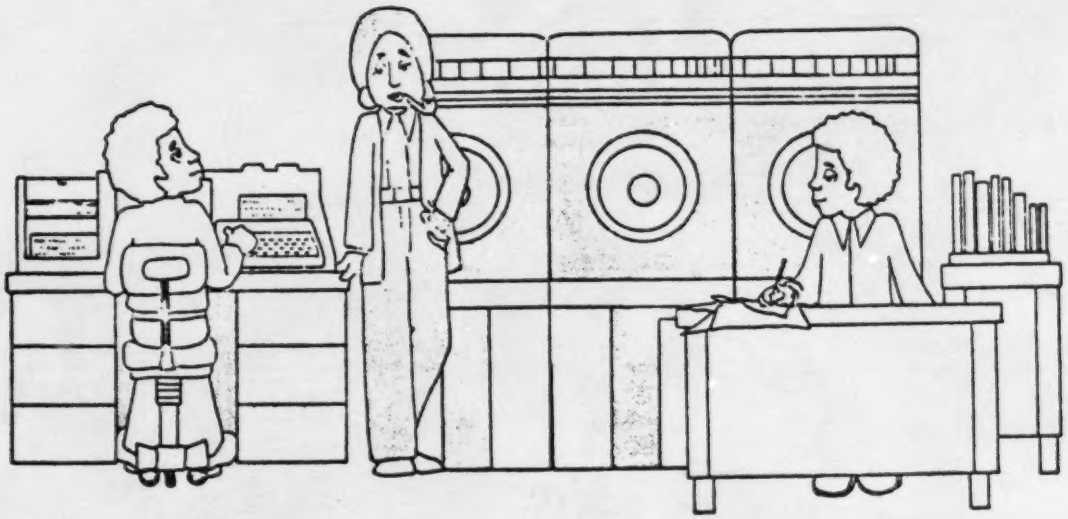
Of MARY LEE CANDY DISTRIBUTORS

In the next 14 pages, you have an opportunity to be a shadow to a systems analyst, a programmer, and a computer operator. You will perform a small sample of their work for Mary Lee Candy Distributors. You will:



1. WRITE A FLOW CHART

2. PREPARE A CODING SHEET



3. PUNCH DATA CARDS

4. WRITE A PROGRAM FOR THE COMPUTER

(Simulation Page 1)

Preparing a Flow Chart on Inventory Processes

You are going to spend a day as an assistant in the data processing department of Mary Lee Candy Distributors which wholesales Mary Lee boxes of chocolates to 27 retail stores. The retail stores in turn sell to shoppers who pass by the stores. Mary Lee Candy Distributors obtain the candy from a manufacturer. You will spend some time working with the systems analyst, the programmer, and the computer operator. In each case, you will be required to perform some of the work that these employees are doing at the time you are with them.

When you arrive at the Mary Lee Candy Distributors, you are first introduced to the systems analyst who is preparing a flow chart about one operation of the Mary Lee Candy Distributors. This operation concerns keeping an inventory of boxes of chocolates. The systems analyst hands you some notes to read that he has made after the president of the company directed him to set up a perpetual inventory of candy stock. Perpetual inventory is defined as a record of boxes of candy on hand at all times. Previously, the inventory was taken on the first of the month. Thus, the actual number of boxes on hand was known only on the first of the month.

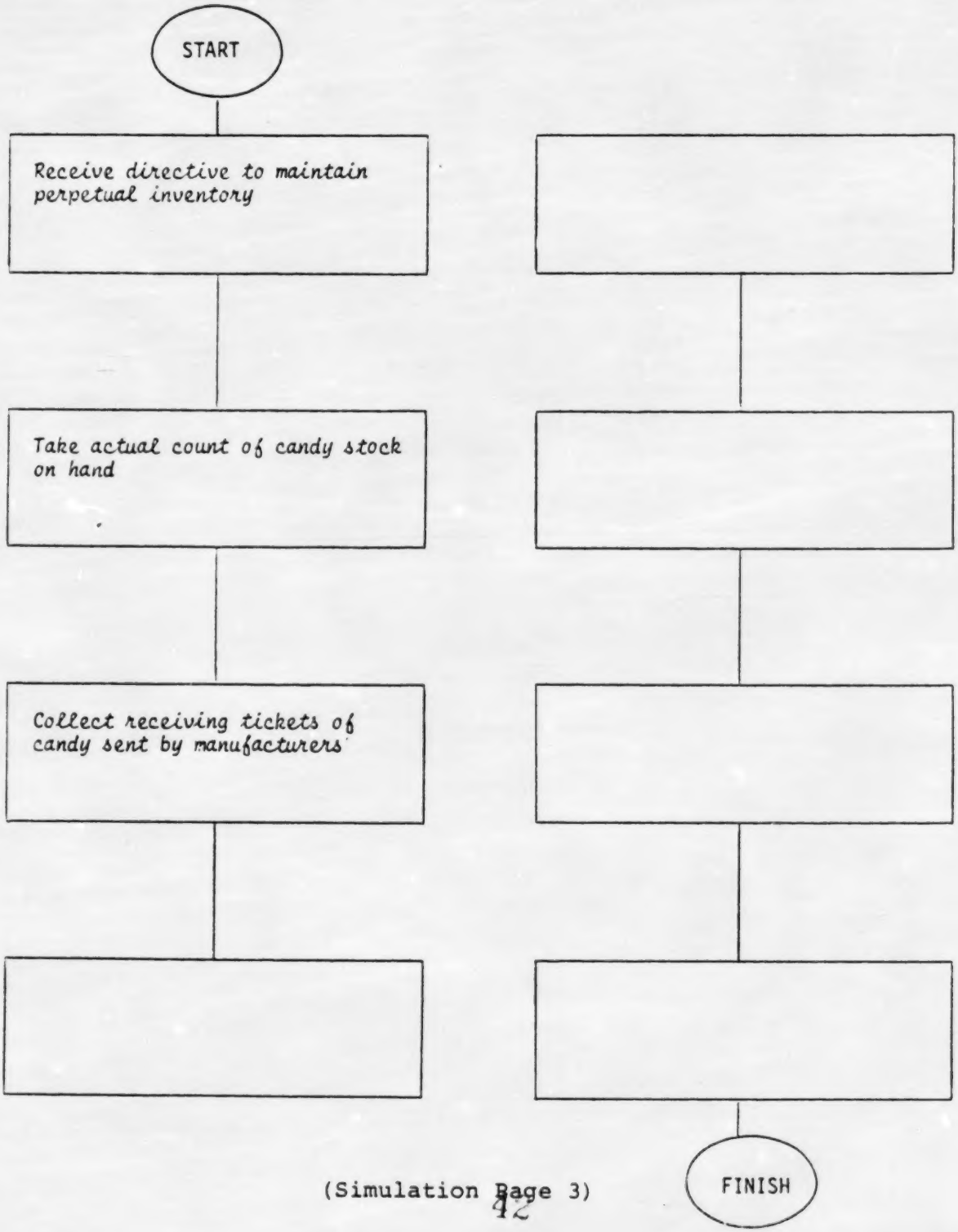
Perpetual Inventory Notes

February 17, 19--

1. The president has directed the systems analyst to set up a system to keep a perpetual inventory.
2. In order to start the system, it will be necessary to obtain an actual count of all boxes of candy on hand.
3. Then, copies of all receiving tickets of candy from the manufacturers must be sent to the data-processing department daily.
4. The receipts as shown on the receiving tickets must be immediately added to the inventory.
5. Copies of all shipping orders of candy going to the Mary Lee Retail Stores must be sent to the data-processing department.
6. The issue of candy as shown on shipping orders must be immediately subtracted from the inventory.
7. At any time during the business day, the data-processing department should be able to report by telephone the current inventory to other departments.
8. A report (printout) of the current inventory should be made available to the president at 8:00 a.m. each day.

(Simulation Page 2)

The systems analyst asks you to complete the flow chart shown below. You are to fill in the empty blocks with the key ideas in each of the numbered notes. The first three blocks are already filled in. Fill in the remaining five blocks.


START
Receive directive to maintain perpetual inventory
Take actual count of candy stock on hand
Collect receiving tickets of candy sent by manufacturers
FINISH

Activity 2

Preparing a Coding Form

Next, you are introduced to Sharon Burns, the computer operator, who is preparing a coding form. The preparation of a coding form is only one of her many duties. A coding form is used to prepare information for the computer. She shows you two business forms and a coding form on which some information from the forms has been written. Sharon shows you how to find information on the forms and copy it on the coding form. Later, you will have the opportunity of finding out how the coding form is used to put information into the computer.

Mary Lee Candy Distributors
4120 Peach Street
Atlanta, Georgia

RECEIVING REPORT
No. 9873
Date 1/7/--

Purchased From:

Sweet Chocolate Confectionery Mfg. Co.
4568 Industrial Parkway
New Orleans, Louisiana

Quantity Ordered	Quantity Received	Stock Number	Description	Unit Price
1,000 boxes	1,000 boxes	305	Chocolates	

Goods Received 1/10/--
Quantity Checked [illegible]

Receiving Report: Look at the Receiving Report above and answer the following questions:

1. Did Mary Lee Candy Distributors receive something from the Sweet Chocolate Confectionery Manufacturing Company? _____
2. What was received? _____
3. What is the stock number of the "thing" received? _____
4. How much was received? _____
5. When was it received? _____
6. Was the quantity checked to see whether the correct amount was received? _____

Coding Form: Look at the coding form shown below and answer the questions:

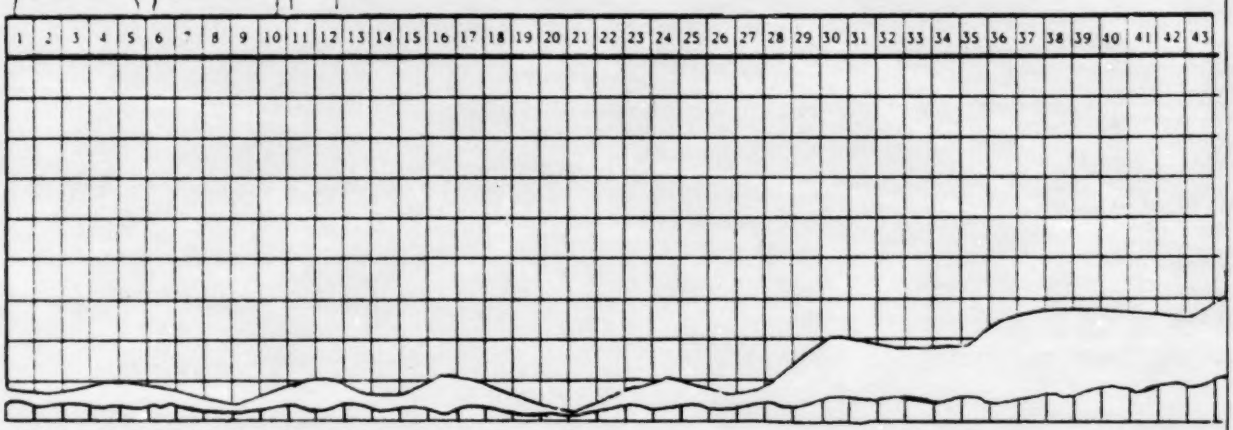
CODING FORM

NAME: _____ LOCATION: _____

PROGRAM: _____

_____ FORTRAN _____ COBOL _____ BASIC

Stock No. Quantity R/S



R/S: R stands for Receiving Report; code 10
S stands for Shipping Order; code 20

Coding Form: This form usually has 80 columns instead of the 43 shown. It usually has 25 rows. The terms Fortran, COBOL, and Basic refer to computer languages which are studied in computer training programs.

Answer the following questions:

1. How many columns does a complete coding form usually have? ____
(Hint: See the note beneath the Coding Form.)

2. How many rows does a complete coding form usually have? _____

3. How many spaces are available for the Stock Number? _____
(Hint: See middle left of the Coding Form.)

4. How many spaces are available for the quantity? _____

5. What does the R in R/S mean and what is its code? _____ ___

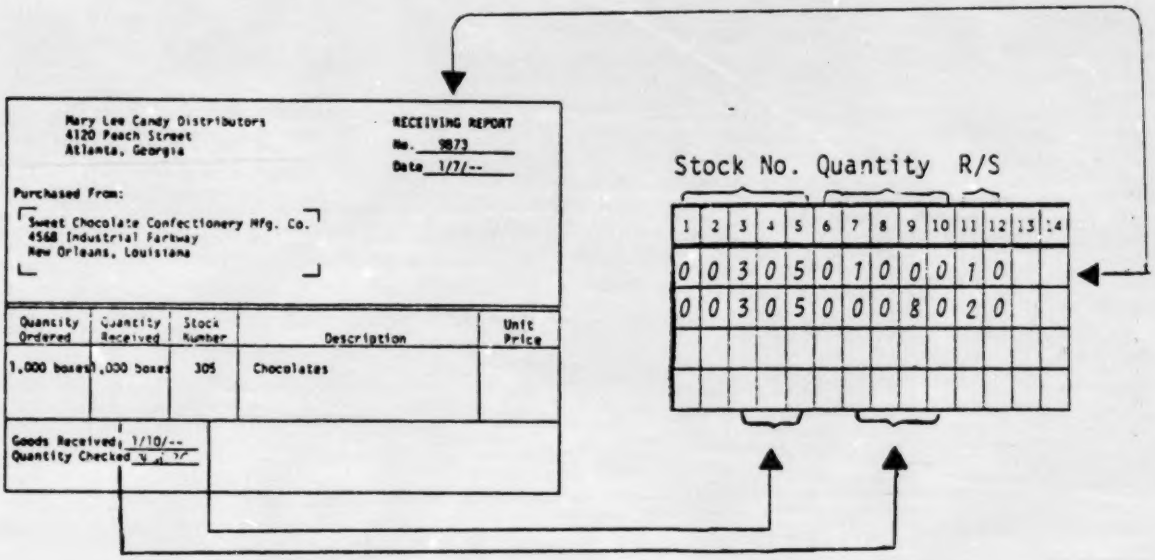
6. What does the S in R/S mean and what is its code? _____ ___

7. How many spaces are available for an R or an S? _____

(Simulation Page 5)

Entering the Receiving Report on the Coding Form

The Receiving Report is coded on the first line of the coding form as shown below. Note that zeroes are used to fill in the blank spaces. Also notice how the stock number 305 is written in columns 1-5 and that two zeroes are written in front of 305 to fill up all five columns.



Answer the following questions:

1. How much candy was received? (See the Receiving Report.)
   _____

2. In which columns of the Coding Form was the quantity written? How many zeroes were needed to fill up the spaces in front of the quantity? _____

3. In which columns of the Coding Form was the stock number written? _____
   How many zeroes were needed to fill up the spaces in front of the stock number? _____

4. What number is used to show the kind of report that is being put on the coding form? _____

5. In which columns is the Receiving Report code number written?
   _____

(Simulation Page 6)

Shipping Order

Mary Lee Candy Distributors
4120 Peach Street
Atlanta, Georgia

SHIPPING ORDER
No. A749
Date 1/5/--

Sold To: Mary Lee # 10
South Shopping Mall
Atlanta, Georgia

Ship To: Same

Quantity Ordered	Stock Number	Description	Unit Price	Quantity Shipped	Quantity Back Ordered
80 boxes	305	Mary Lee chocolates		80 boxes	

Look at the Shipping Order above and answer the following questions:

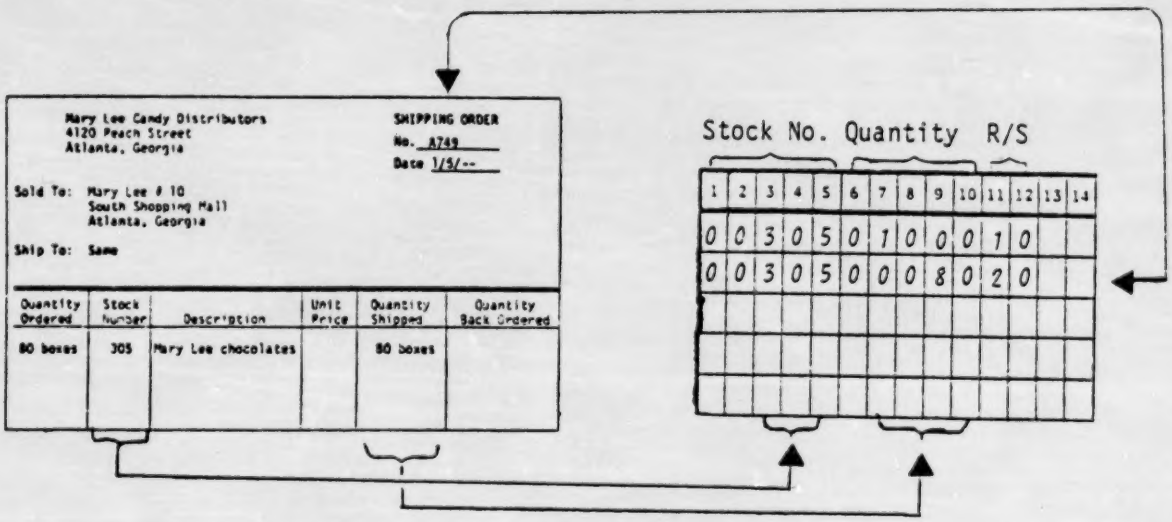
1. What is the name of the store that Mary Lee Candy Distributors sent some candy to? _____

2. How many boxes were sent? _____

3. What is the stock number of the candy sent? _____

Entering the Shipping Order on the Coding Form

The Shipping Order is coded on the second line of the Coding Form as shown below:



Answer the following questions:

1. In which columns of the Coding Form was the quantity shipped written? _____

2. How many zeroes were needed to fill up the empty spaces? ___

3. In which columns of the Coding Form was the stock number written? _____

4. How many zeroes were needed to fill up the empty spaces? ____

5. What number is used to show the kind of report that is being put on the Coding Form? _____

6. In which columns is the Shipping Order code number written? _____

Your Job Assignment

Copy the necessary information from these two forms on the Coding Form on page 41. Sharon has put you on your own.

Mary Lee Candy Distributors
4120 Peach Street
Atlanta. Georgia

RECEIVING REPORT
No. 9874
Date 1/15/--

Purchased From:

Sweet Chocolate Confectionery Mfg. Co.
4568 Industrial Parkway
New Orleans, Louisiana

Quantity Ordered	Quantity Received	Stock Number	Description	Unit Price
500 boxes	500 boxes	306	Chocolates	

Goods Received 1/10/--
Quantity Checked H. S. V.

Mary Lee Candy Distributors
4120 Peach Street
Atlanta, Georgia

SHIPPING ORDER
No. A750
Date 1/6/--

Sold To: Mary Lee # 19
South Shopping Mall
Atlanta, Georgia

Ship To: Same

Quantity Ordered	Stock Number	Description	Unit Price	Quantity Shipped	Quantity Back Ordered
120 boxes	306	Mary Lee chocolates		120 boxes	

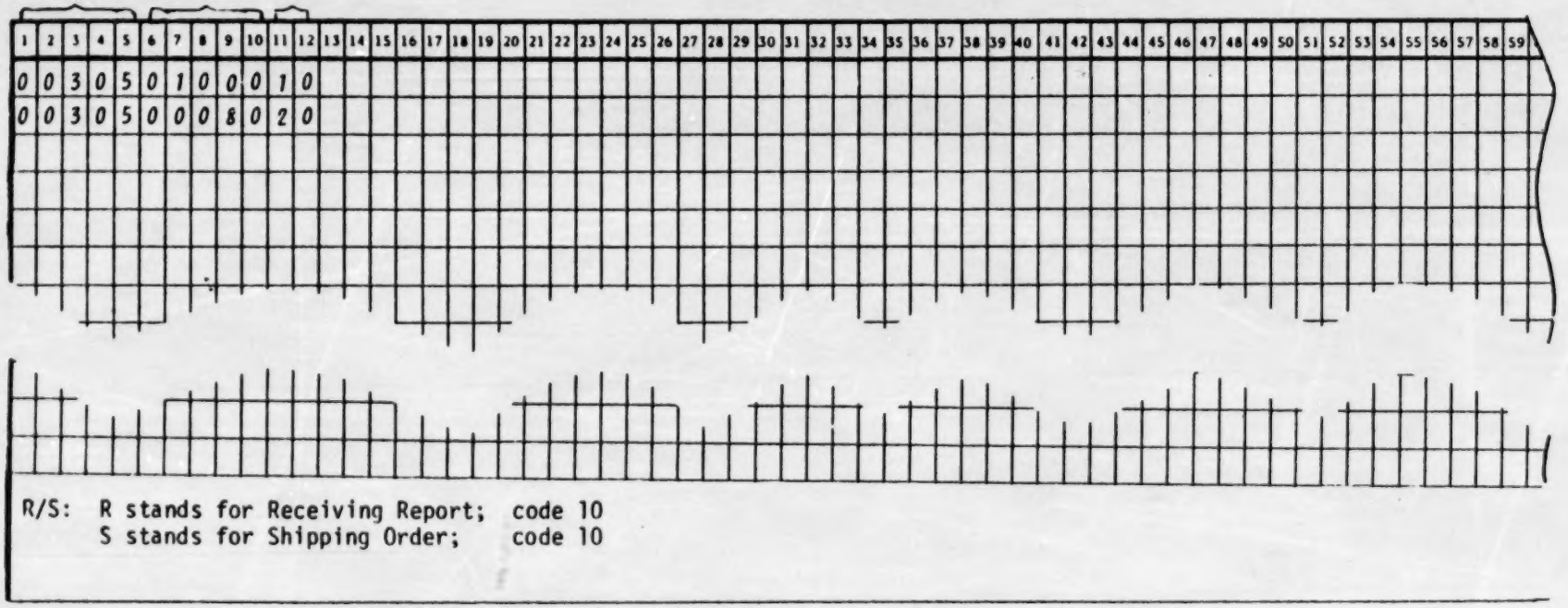
CODING FORM

NAME: _____ LOCATION: Data Processing Department PHONE: _____

PROGRAM: Inventory

_____ FORTRAN _____ COBOL _____ AUTOCODER _X_ BASIC

Stock No. Quantity R/S



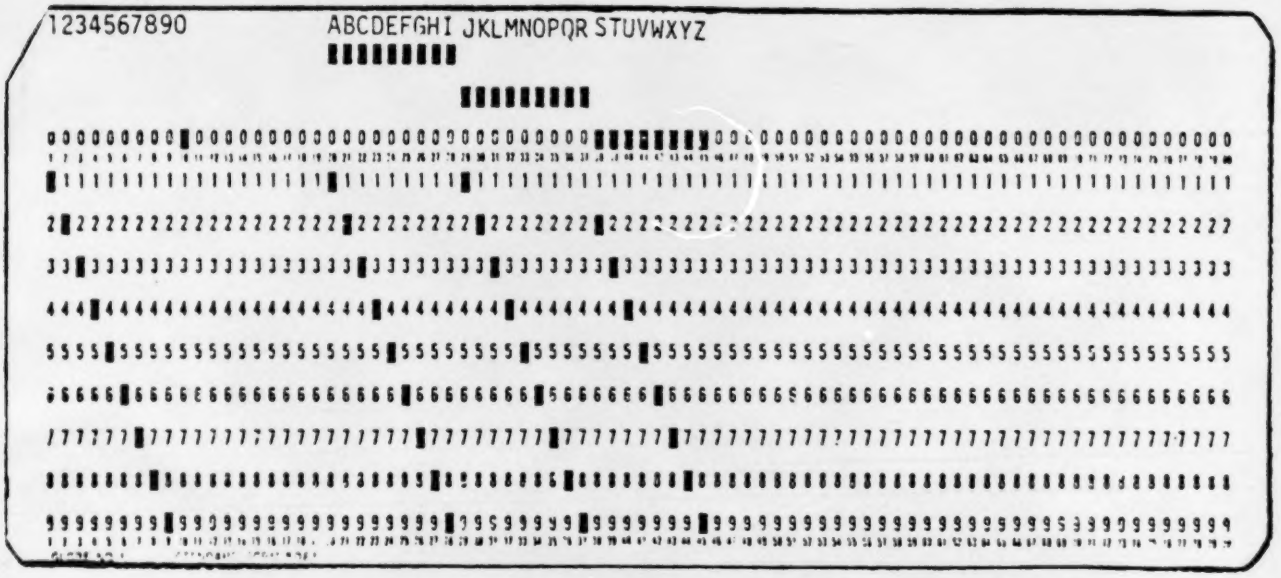
R/S: R stands for Receiving Report; code 10
S stands for Shipping Order; code 10

(Simulation Page 10)

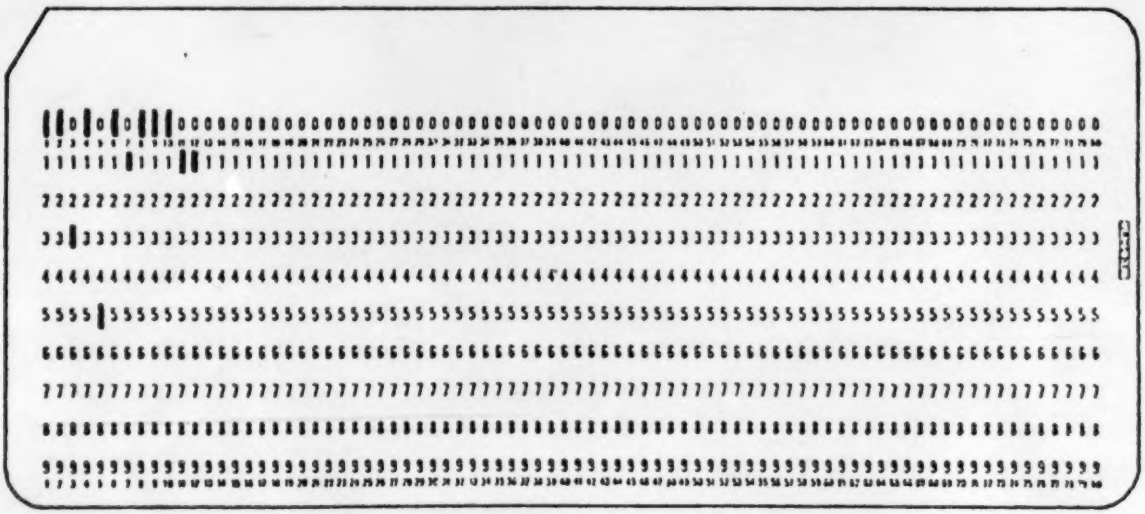
Activity 3

Reading and Punching Cards

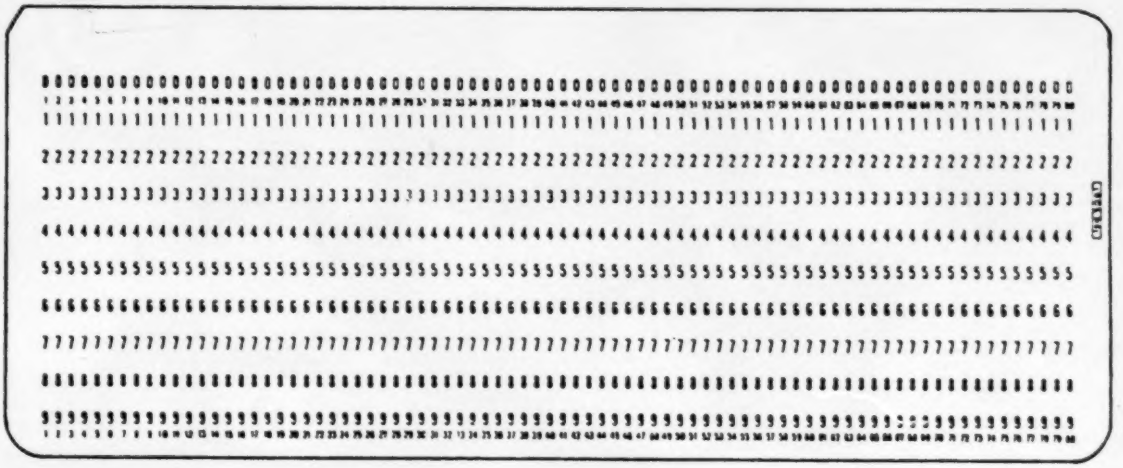
Next, you are introduced to Loren LaFave, the computer operator, who is checking a punched card for accuracy. The computer has a reader that can read holes in a punched card. A punched card is shown below. You can read print by means of your eyes and hear words by means of your ears. The computer only reads by means of holes in a card or by magnetic spots on a tape, such as found in a tape recorder.

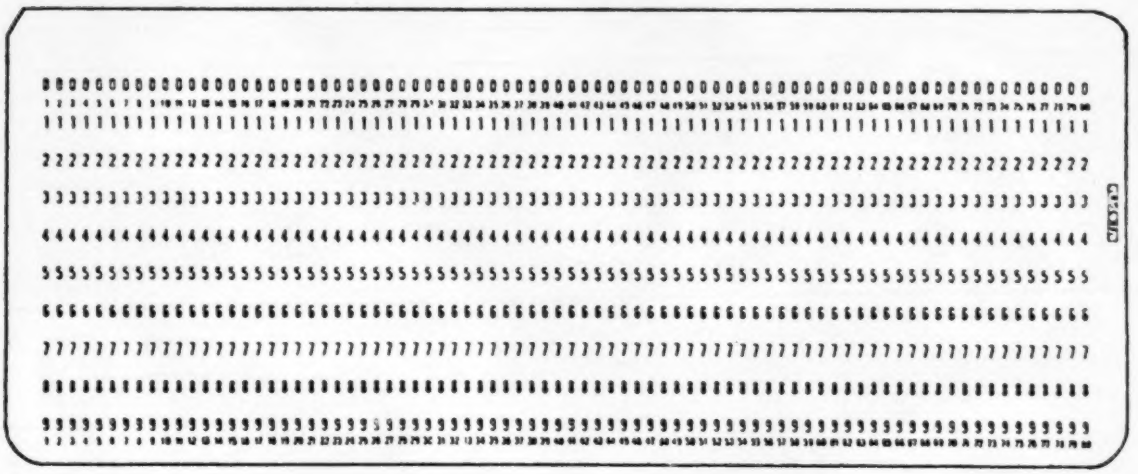


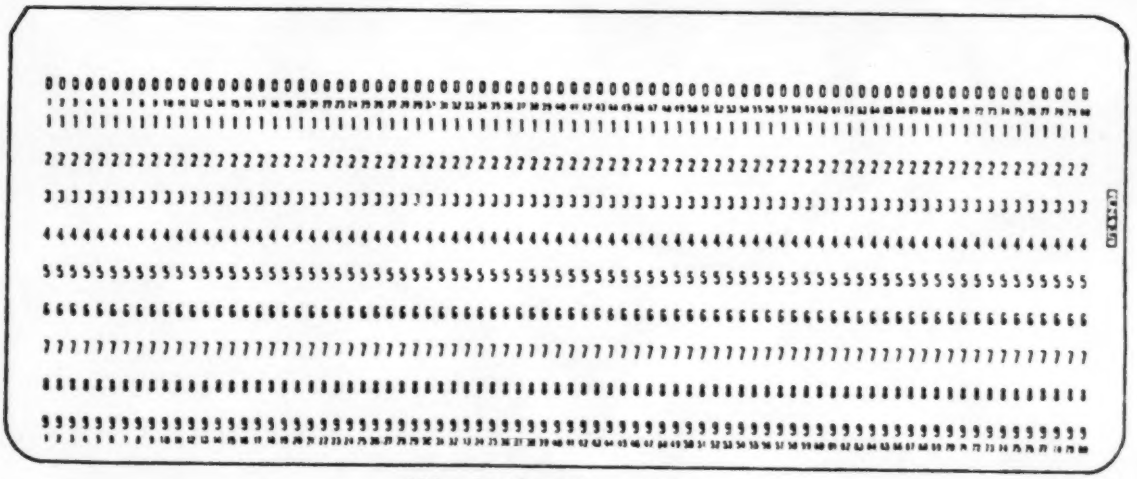
Loren shows you a card with punches in it that are supposed to correspond with the first line on the coding form that you just learned about. He says that each number on the first line has been punched in the card. Notice that the first number on the coding form is 003050100010. Notice that it has been punched into the card below. Also, notice that the first two zeroes have been punched in the card. Now compare number by number to determine whether the rest of the numbers on the card are correct. Did you find any errors? If so, what are they? _____



The first line of the coding form has been "punched" on the card illustrated on the previous page. Now, you must punch the numbers from the remaining three lines onto separate cards. Remember that there were two lines on the coding form and you wrote two more. There should be a card for each line on the coding form. Use the cards below and your pencil to "punch" them. If a card punch is available in your school, you can observe a machine that actually punches cards.







Activity 4

Preparing A Program for the Computer

Next, you are introduced to Juan Garcia, a computer programmer, who shows you some instructions he is writing for the computer. He tells you that later these instructions have to be re-written in computer language, which he will show you when he is ready to do that step. He tells you that when you want to solve a problem such as adding and subtracting numerous items from the inventory, you can't just hand the computer the problem. You must prepare detailed instructions, which are put into the computer memory so that it can compute inventory. Suppose that you wanted the computer to do this problem: Subtract 173 from 432.

Below is shown what Juan has been writing.

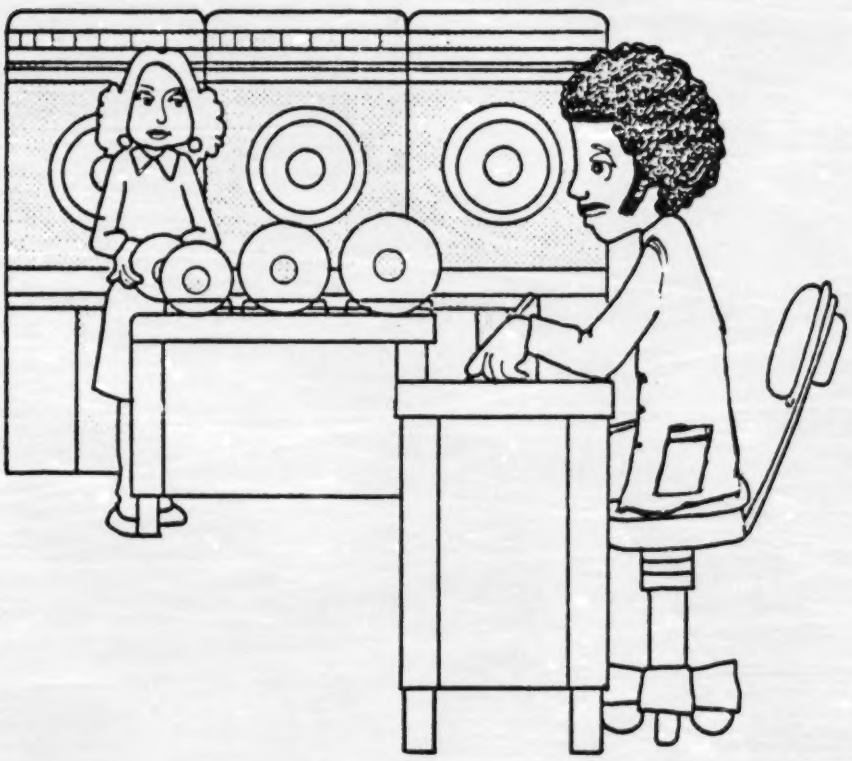
Instructions	Mathematics	Answer Space
1. Read A and B.	1.	
2. A is 432.	2. 432	
3. B is 173.	3. 173	
4. Start at the right. Can 3 be subtracted from 2? If so, subtract. If not, go to the next step.	4. No	
5. Regroup 432 as 420 and 12.	5. 420 + 12	
6. Under 420 + 12, rearrange 173 as 170 and 3.	6. 170 + 3	
7. Subtract 3 from 12. Write 9 in the answer space.	7. 12 - 3	9
8. Can 70 be subtracted from 20? If so, do it. If not, go to the next step.	8. No	
9. Regroup 420 as 300 and 120.	9. 320 +120	
10. Beneath 300 + 120, rearrange 170 as 100 and 70.	10. 100 + 70	
11. Subtract 70 from 120. Put 50 in the answer space.	11. 120 - 70	50
12. Can 100 be subtracted from 300? If so, do it.	12. 300 -100 200	
13. Put 200 in the answer space.		200
14. Add all the numbers in the answer spaces.	14.	259

Juan says that programmers have to be able to write instructions for computers before they rewrite them in computer language. He tells you to write instructions for this problem: Subtract 48 from 235. Use the space below. You may or may not need 14 steps. Use as many as needed.

Instructions	Mathematics	Answer Space
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		

(Simulation Page 14)

WOULD I LIKE TO WORK WITH COMPUTERS



1.	Would you like to plan with others in a business which activities will be handled by the data processing department?	YES	NO
2.	Would you like to prepare flow charts that show how a business activity will be handled by the DP department?	YES	NO
3.	Would you like to plan and prepare coding forms?	YES	NO
4.	Would you like to enter information from business papers on a coding form?	YES	NO
5.	Would you like to punch cards?	YES	NO
6.	Would you like to write programs for the computer?	YES	NO
7.	Do you like to solve crossword puzzles?	YES	NO

If you answered most of the above questions yes, you may want to find out more about data processing jobs and how to prepare for them.

(Simulation Page 15)

BACKGROUND INFORMATION FOR DATA PROCESSORS

There are 70,000 to 80,000 computers in the United States today, and there are over one million people working with them in one way or another. Some people operate equipment that prepares data for the computer. Some people work with the output of the computer. Some people feed data to and operate the computer. Some people prepare instructions for the computer that "tell" the computer what to do. Others plan what the computer will do. Of course, there are those who manufacture, repair, service, and sell computers.

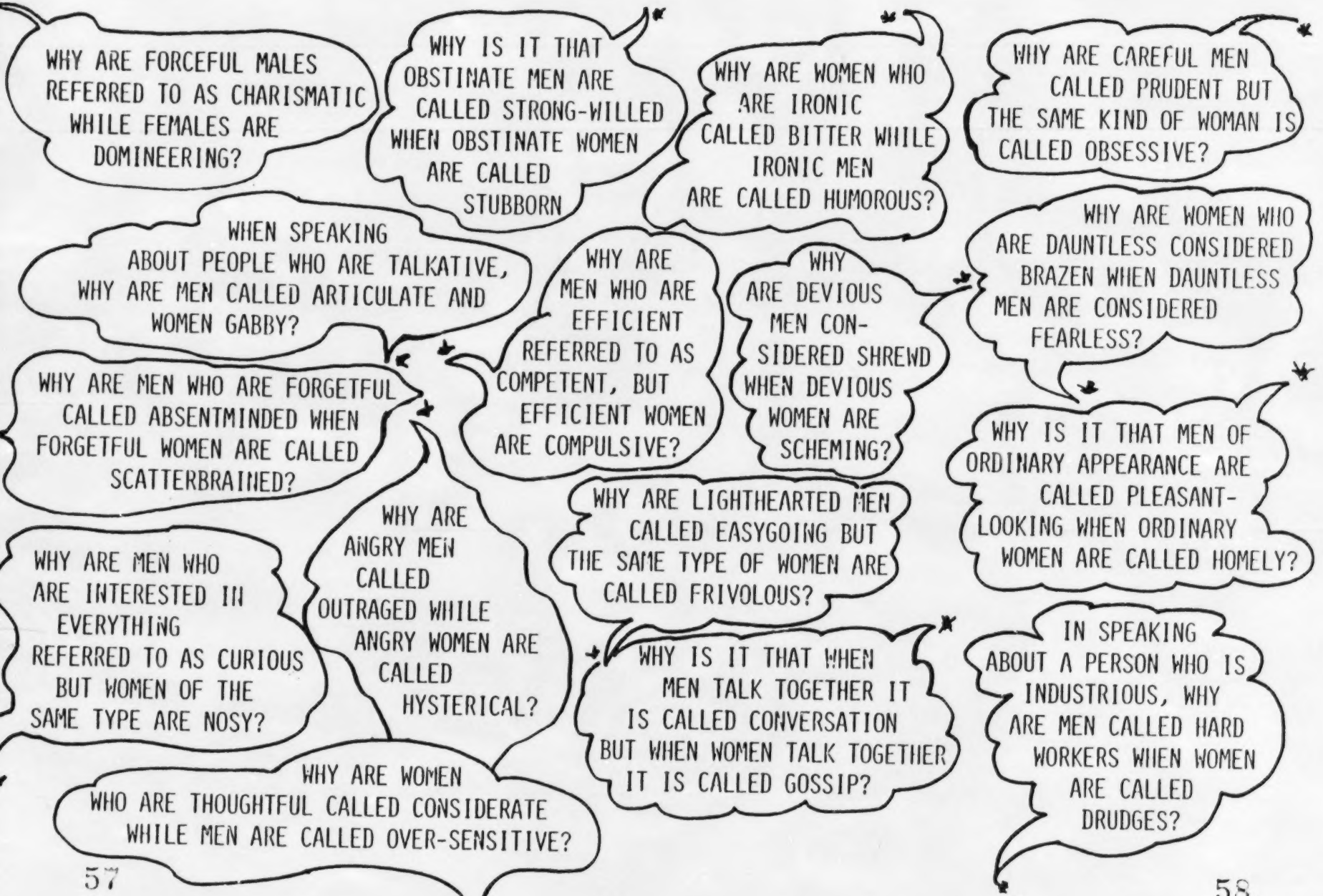
Below is a list of duties and the job titles of those people mainly responsible.

THE MAIN DUTIES OF DATA-PROCESSING EMPLOYEES *X - Usually responsible for various of the ten items below.* *O = Often also assists in doing, or does, the items below.*	*Systems Analyst*	*Programmer*	*Computer Operator*	*Clerical Personnel Key-punch Operator*
1. *Plans which business activities can be handled by computer.*	X	O		
2. *Prepares systems flow charts that describe the business activities and the parts that will be handled by the data processing department.*	X	O		
3. *Writes programs that tell the computer what to do.*	O	X		
4. *Plans with others about the use of the data processing department.*	X	X	X	
5. *Prepares coding sheets and codes information.*		O	O	X
6. *Gets cards, tapes, and other things ready for the computer.*		O	O	X
7. *Punches cards.*		O	O	X
8. *Operates computer equipment.*	O	O	X	O
9. *Debugs computer programs.*	O	X	O	
10. *Assists other data processing employees.*			O	X

How do you prepare for a data-processing job? There are many routes. You can take recordkeeping, accounting, business math, and data-processing courses in high school that will be helpful in some of the beginning jobs. Colleges have computer science departments. Also, you can sometimes, as a beginning employee in business and industry, enroll in company training programs offered while you work.

What kind of personal traits should you have? Here is a list of some of them:

Like to work with data and information
Like to solve puzzles, such as cross-word puzzles
Like to be extremely accurate and make things prove out


WHY ARE FORCEFUL MALES REFERRED TO AS CHARISMATIC WHILE FEMALES ARE DOMINEERING?
WHY IS IT THAT OBSTINATE MEN ARE CALLED STRONG-WILLED WHEN OBSTINATE WOMEN ARE CALLED STUBBORN
WHY ARE WOMEN WHO ARE IRONIC CALLED BITTER WHILE IRONIC MEN ARE CALLED HUMOROUS?
WHY ARE CAREFUL MEN CALLED PRUDENT BUT THE SAME KIND OF WOMAN IS CALLED OBSESSIVE?
WHEN SPEAKING ABOUT PEOPLE WHO ARE TALKATIVE, WHY ARE MEN CALLED ARTICULATE AND WOMEN GABBY?
WHY ARE MEN WHO ARE EFFICIENT REFERRED TO AS COMPETENT, BUT EFFICIENT WOMEN ARE COMPULSIVE?
WHY ARE DEVIOUS MEN CONSIDERED SHREWD WHEN DEVIOUS WOMEN ARE SCHEMING?
WHY ARE WOMEN WHO ARE DAUNTLESS CONSIDERED BRAZEN WHEN DAUNTLESS MEN ARE CONSIDERED FEARLESS?
WHY ARE MEN WHO ARE FORGETFUL CALLED ABSENTMINDED WHEN FORGETFUL WOMEN ARE CALLED SCATTERBRAINED?
WHY IS IT THAT MEN OF ORDINARY APPEARANCE ARE CALLED PLEASANT-LOOKING WHEN ORDINARY WOMEN ARE CALLED HOMELY?
WHY ARE LIGHTHEARTED MEN CALLED EASYGOING BUT THE SAME TYPE OF WOMEN ARE CALLED FRIVOLOUS?
WHY ARE MEN WHO ARE INTERESTED IN EVERYTHING REFERRED TO AS CURIOUS BUT WOMEN OF THE SAME TYPE ARE NOSY?
WHY ARE ANGRY MEN CALLED OUTRAGED WHILE ANGRY WOMEN ARE CALLED HYSTERICAL?
WHY IS IT THAT WHEN MEN TALK TOGETHER IT IS CALLED CONVERSATION BUT WHEN WOMEN TALK TOGETHER IT IS CALLED GOSSIP?
IN SPEAKING ABOUT A PERSON WHO IS INDUSTRIOUS, WHY ARE MEN CALLED HARD WORKERS WHEN WOMEN ARE CALLED DRUDGES?
WHY ARE WOMEN WHO ARE THOUGHTFUL CALLED CONSIDERATE WHILE MEN ARE CALLED OVER-SENSITIVE?

*BECAUSE OF SEXISM IN LANGUAGE

ACTIVITY (f)

QUALIFICATIONS FOR EMPLOYMENT

1. PURPOSE

   (a) To expose students to the many different jobs available in Data Processing Occupations.

   (b) To show students that the qualifications for employment are not determined by sex.

2. PROCEDURE

   (a) The teacher should decide which occupation to focus on and discuss the many jobs available within the module. The teacher might make a list on the board like the one below and have students add to the list.

Examples of Job Opportunities in the Data Processing Field:

DATA PROCESSING OCCUPATIONS

[a]U.S.O.E.	[b]D.O.T.	POSITIONS
14.0201	203.362-018	Terminal Systems Operator
14.0202	203.582-022	Data Typist
14.0202	203.582-030	Keypunch Operator
14.0202	203.582-054	Terminal Operator
14.0299	209.387-022	Data Exam Ass't.
14.0299	213.132-010	Computer Operations Supervisor
14.0201	213.362-010	Computer Operator
14.0202	213.382-010	Computer/Peripheral Equipment Operator
14.0299	219.137-014	Data Control Ass't. Supervisor
14.0203	219.367-026	Programmer (Trainee)

A list of job opportunities specific to the course should be developed. In discussion or through research, students may learn what each of the jobs entail.

(b) When the list is fairly complete, distribute the student activity sheet and have the students decide independently which job or jobs this person is qualified for. Discuss after they have decided.

- How did you decide upon a position?
- What qualities do you see necessary for all areas of employment?
- What characteristics are not at all necessary for employment?
- Do you think this person is a male or a female? Why?
- If you learned that the person currently filling the position was a male, how would this influence your choice of position?
- In looking at the qualifications of the applicant, is this person over qualified for the job? Under-qualified?
- Suppose you learn the sex of the applicant. Would you change your job offer? Why?
- What jobs are you interested in?
- How are you qualified for these jobs?

3. VARIATION OR FOLLOW-UP

Have students research any job in which they have an interest. From the research, have them list the requirements they feel are necessary for the job. Do they see this job as being exclusively for a male or a female? What requirements would limit the job to one sex? Has their perception of the job changed any after researching it? Have students share their results with the class. Use the "Financial Facts of Life" Activity.

M. Smith has just graduated from high school and is applying for a job. In the interview and from the references, the personnel director finds that the candidate has the following qualities:

(a) A knowledge of the company through summer jobs.

(b) A good grade average in high school.

(c) A good attendance record in high school.

(d) Business and math skills.

(e) A pleasant personality.

(f) A desire to move up in the company.

(g) Recommendations that indicate the candidate is dependable and has an ability to get along with other people.

(h) A knowledge of safety precautions; an awareness of the importance of following instructions.

(i) A driver's license.

(j) Good health and neat appearance.

What jobs would you offer M. Smith?

A Riddle

While driving to the store, a young boy and father were involved in a serious car accident. The father was killed and the boy was injured and taken to a hospital. At the hospital, the boy was examined and an emergency operation was needed. The resident surgeon had scrubbed up, put on a gauze mask, and was waiting in the operating room when the boy was wheeled into surgery. The surgeon took one look at the boy and cried, "I can't operate. This is my son."

Who was the surgeon?

-- source unknown

Answer: The boy's mother.

GRADUATION

Suggested Use: May

GOOD LUCK GRADUATES!

CLERICAL OCCUPATIONS

MANAGEMENT ASSISTANT OCCUPATIONS

DATA PROCESSING OCCUPATIONS

ADMINISTRATIVE ASSISTANT OCCUPATIONS

ACCOUNTING OCCUPATIONS

WHERE ARE YOU GOING?